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Author(s): Saarinen, Jussi A.; Krueger, Joel

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Making Space for Creativity: Niche Construction and the Artist's Studio

Jussi A. Saarinen and Joel Krueger

ABSTRACT

It is increasingly acknowledged that creativity cannot be fully understood without considering the setting where it takes place. Building on this premise, we use the concepts of niche construction, scaffolding, coupling, and functional integration to expound on the environmentally situated nature of painters' studio work. Our analysis shows studios to be multi-resource niches that are customized by artists to support various capacities, states, and actions crucial to painting. When at work in these personalized spaces, painters do not need to rely solely on their "inner" powers of imagination, memory, decision making, and technique to execute their paintings. Instead, with the help of carefully selected resources, they can offload elements of creative mentation and action onto the studio niche and enact different forms of a creative agency. To put more flesh on these ideas, we examine how painters use (1) existing artworks, (2) memory aids, and (3) music to scaffold the creative process. Overall, our analysis illuminates underexamined aspects of environmentally situated creativity and demonstrates the broader utility of the applied concepts for future creativity research.

I. INTRODUCTION

In the common imagination, a studio is a special place where artists toil in seclusion to work their magic. This notion is often reinforced by artists themselves. Michael Craig-Martin, for instance, is straightforward about the importance of his studio: "Everything is planned here, everything is worked out here. It's kind of the centre of my thinking. I come here every morning and stay into the evening" (Christie's 2015). While such brief disclosures confirm the general importance of studios for artists, they also leave us wondering about the more specific ways in which workspaces are customized to support their occupants' creative pursuits. This curiosity is not limited to laypersons only, as artists too are interested in the where-and-how of their colleagues' craft. Tellingly, Jenny Saville recalls falling in love with the studios of Giacometti and Bacon before fully appreciating any of their paintings. She also claims—with a hint of irony, perhaps—that seeing De Kooning's brushes and mixing bowls in their original surroundings taught her more about painting than art school ever had. (Luke and Saville 2020)

Our shared fascination with studios indicates that the nature of creative work cannot be fully understood without factoring in the setting where it takes place. This principle has informed recent creativity research in two noteworthy ways. First, increasing attention has been paid to how creative practitioners actively construct and utilize particular environments to enhance their creative efforts, and second, it has been argued that, as ecologically situated processes, creative cognition, and action interweave with the environment in various significant ways (see, e.g., Brinck 2007; Glăveanu 2014; Malinin 2016; Fabry 2018; Withagen and van der Kamp 2018). Together these studies suggest that the studio *is* indeed a special place where special things *do* happen, not only in terms of creative output but also in regard to the artist's mind. But how, precisely, are artists bound up with their studios, and what does this close-knit relation entail for the cognitions and actions intrinsic to creativity?

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We expound on these questions in the context of painting by combining two developments in contemporary philosophy of mind. While the concepts of *niche construction* and *scaffolding* will serve to elaborate how painters set up and use their studios for creative purposes, the notions of *coupling* and *functional integration* will help spell out how personalized studio resources mesh with thinking, feeling, and doing to benefit painting. To put some flesh on the proposed approach, we analyze three notable ways in which painters engineer and exploit their studios for creative ends. More precisely, we examine how painters use (1) *existing artworks*, (2) *memory aids*, and (3) *music* to facilitate and support the creative process. Overall, then, our analysis illuminates several underexamined aspects of environmentally situated creativity. We conclude the article with a summary and a brief note on future avenues for research.

II. THE NICHE CONSTRUCTION APPROACH TO THE PAINTER'S STUDIO

The term “niche construction” derives from evolutionary biology, where it refers to activities by which organisms modify their selective environments in ways that significantly influence their own behavior and evolution, and typically those of future generations and other species as well (Odling-Smee, Laland, and Feldman 2003). For example, when beavers construct dams, they exert selective pressure not only on themselves and future beaver generations but also on other species that inhabit the restructured environment. We humans are essentially the same: by actively shaping our environments, we too continuously modify the adaptive fit between our worlds and ourselves. The main difference is that, for better or worse, human niche construction has reached considerably higher degrees of complexity due to our linguistic, socio-cultural, and technological advancements.

From this basis in biology, niche construction research has diverged into several lines of investigation with differing explanatory concerns. Philosophers of mind and cognition have been particularly keen on examining how the niches we construct influence our *cognitive* and *experiential* lives (see, e.g., Clark 2008; Sterelny 2010; Colombetti and Krueger 2015; Bertolotti and Magnani 2017; Heersmink 2020). Needless to say, clear conceptual parameters must be in place before any such analyses can get off the ground. The fact is that niches vary widely in the number of agents involved in their construction, modification, and exploitation, and also with regard to their causal mechanisms and temporal scopes of influence. To simplify, on one end of the spectrum we find individual agents building customized niches for relatively immediate personal purposes, such as “mancaves” that enable certain (ostensibly) masculine activities and experiences for the resident “cavemen.” On the other end we have collectively engineered and trans-generationally transmitted niches that affect how larger populations think, feel, and behave, as in the case of religious spaces and traditions. Given this broad variation, one limiting option has been to focus on the *real-time causal interactions and dependence relations* between individuals and their proximate niches. Here, the spotlight is thrown on “organism-niche coordination dynamics” (Fabry 2021, 1): an aspect of niche functioning that is conceptually and ontologically separable from the longer-term and causally distinct processes of genetic and cultural-developmental niche construction.

We too adopt a nongenetic, individually focused, and temporally limited approach to studying the enmeshment of painter and studio. This does not mean that the mentioned types of niche construction are mutually exclusive, nor that one strand of niche research is superior to the other. Certainly, many aspects of studio practice also depend on shared art historical and technological niches that have evolved over longer periods of time. We have opted for the stated approach simply because it suits the analytic aims of this study. The following specifications clarify further what we mean by niche building and niche exploitation in an individualized, here-and-now studio context.¹

To begin, niches can be made up of various types of *environmental resources*, ranging from material objects and physical spaces to symbolic systems and other people. In this broad sense, whatever serves to enable, support, enhance, or transform a mental capacity, experiential state, or action can function as a resource. A condensed way to express this idea is to say that environmental resources *scaffold* our minds and behaviors (Sterelny 2010; Colombetti and Krueger 2015; Sutton 2016; Varga 2019; Saarinen 2020b). In ecological terms, these scaffolding resources can also be construed as *affordances*—that is, as relationally established possibilities for (inter-)action provided by the niche

(Gibson 1979; see also Krueger 2014; Rietveld and Kiverstein 2014). Together these conceptualizations underline the fact that our thinking, feeling, and acting commonly depend on, and are thus codetermined by, our active engagements with the environment.

One way to sort out the multitude of available resources is to classify them into groups according to some distinctive property, for example into animate versus inanimate, natural versus artefactual, or representational versus nonrepresentational resources (Sutton 2006, 2016; Heersmink 2013; Colombetti 2020). Guided by such taxonomical interests, we might want to focus on, say, the *architectural* structuration of studios to illuminate how their locational features, building materials, spatial layouts, and furnishings figure in the practice of painting (see Malinin 2016). Alternatively, the spotlight could be turned to the array of *tools* and *materials* at hand in the studio, such as the artist's personalized selection of brushes, sponges, maulsticks, and other implements. If artists rely on assistants, advisers, or live models in their work, their studios can also be regarded as *socially* or *interpersonally* structured niches. While this list could easily be continued, it is clear enough that painters' studios are multi-layered, multiresource niches, and it thus depends on one's research interests which artist–resource interactions are singled out for closer analysis.

In complex niches like studios, different resources tend to affect different states and processes simultaneously, and thus constitute elaborate patterns of causal influence and interaction. The situation can be clarified by designating the general *domain(s)* in which the resources are causally efficacious, namely cognition, perception, affect, or action (see, e.g., Clark 2008; Sutton 2016; Bertolotti and Magnani 2017; Saarinen 2020b). Within these broad and overlapping domains, we may then identify the more specific *targets* of the resources' influence, such as semantic memory, visuospatial attention, mood, or skilled motor execution. Finally, we can elaborate on the *kinds of causal relations* that obtain between the inspected resource–target pairings, including relations of enablement, sustenance, regulation, enhancement, and transformation.

Put together, these considerations provide us with the following formula for detailing niche-specific agent–resource interactions: designated resource (X) performs function (Y) vis à vis target phenomenon (Z). To illustrate, consider Steve Mumford's description of his painting table:

I built it to my own specifications because I needed something that was just the right size to hold these medium-to-large-sized, disposable palettes. (I like to have three of them directly in front of me while I'm painting.) And I also needed it to have some sort of splashboard just because I often mix up a lot of oil with my paint, and I want to make sure it doesn't drip too much, especially not on the painting. It has casters on it so I can quickly and easily move it around, and it's got a shelf below it to store paint. So it is kind of very simple and functional and exactly what I need. (Fig 2009, 149)

In the proposed terms, the customized painting table (X) supports and enhances (Y) the agent's skilled manipulation of paint (Z). The same formula may readily be applied across the entire studio niche to untangle its dense web of scaffoldings. That said, it is worth bearing in mind that individual resources can be effective in more than one domain simultaneously and that particular target states, processes, and actions can likewise be influenced by multiple resources at the same time. Moreover, while some resources impact the painting process unidirectionally, others afford a more reciprocal mode of interaction. For example, the unpredictable behavior of paint on canvas can draw the artist into a cycle of action, assessment, and reaction that instantiates proper reciprocity between the painter and the painting. Needless to say, it is virtually impossible to grasp all of the causal relations in play in the studio. Nor indeed is it necessary, for some relations will be more significant than others for the creative process. (Whether or not the studio's heating works may affect the activity of painting, but not in a way that necessarily warrants closer scrutiny; it is a trivial background factor, as it were.) In practice, then, any niche analysis that aims for explanatory relevance and detail in the suggested here-and-now interactional framework must restrict itself to a limited set of agent–resource configurations.

Another important variable in real-time scaffolding interactions is the extent to which the relevant resource and the scaffolded state become *functionally integrated*—that is, coupled together by reliable and durable causal links (Sutton 2006; Heersmink 2015; Slors 2019; Gallagher and Varga 2020). In cases of low integration, the resource is coupled relatively loosely and thus “merely” enables or supports the target state, whereas in high integration the coupling is so tight that the resource and

target state form a new hybrid system that gains otherwise inaccessible functions.² If, for example, the painter occasionally turns to literature for inspiration, the coupling between the resource and whatever creative capacities or actions it supports will arguably be rather indeterminate and indirect, and thus amount to low, if any, integration. In contrast, when painters regularly use sketches and workflow charts to inform and drive their work, the coupling will likely be much tighter. In some such cases, the resources and the complemented capacities integrate into gainful hybrid systems without which the creative effort would presumably fall short or at least be much more difficult. In sum, during the creative process painters often become coupled—to differing degrees and for differing periods—with studio resources. In our analysis, we pay special attention to the functional gains of relatively high integration.

Finally, it should be noted that both niche construction and agent–resource interactions exhibit varying degrees of *intentionality* and *awareness* on the agent’s part. Clearly, not everything in the studio is set up deliberately by the artist to be as it is. Some features, such as room size and window placement, are relatively fixed and given, and thus constrain the possibilities for more considered forms of niche engineering. Moreover, some of the niche’s features may be unintended by-products of either unreflective habits or more consciously executed actions. Lastly, not all resources that impact on the creative process will be intentionally chosen and exploited for *that* particular purpose, nor will the artist necessarily be constantly aware of those resources that are. From this multiplicity of possibilities, we single out for closer study interactions in which painters deliberately set up and exploit certain studio resources for painterly purposes.

III. SCAFFOLDING CREATIVITY IN THE STUDIO NICHE: THREE EXAMPLES

In this section, we focus on three specific ways in which painters set up and exploit their studios to scaffold creativity. Our discussion places particular emphasis on Jenny Saville’s descriptions of her studio practice, for the following reasons. First, her disclosures are exceptionally rich and perceptive, and as such provide special insight into the working methods of painters. Second, spotlighting one particular practice allows us to give a more cohesive picture of the joint functioning of multiple resources in a single studio niche. And finally, while many features of Saville’s practice are bound to be idiosyncratic, the ones we pinpoint can be extrapolated *mutatis mutandis* to a much wider group of painters. At the same time, Saville’s idiosyncrasies underline the fact that studios are deliberately customized to meet their users’ personal needs and demands. With these considerations in mind, we next explore how painters exploit (III.A) other artists’ creations, (III.B) individualized mnemonic aids, and (III.C) music to scaffold key elements of the painting process.

III.A. Integrating Existing Artwork into Creative Cognition

Painters work in a long tradition of painting and are thus influenced by a mass of already existing art. While some painters connect with other artists’ work only loosely or occasionally, and sometimes even unknowingly, others base their practice more systematically on the achievements of their peers and predecessors. In the latter case, painters can be said to interact with fellow artists, both living and dead, to scaffold their own creative efforts. Saville, like so many others, has accumulated reproductions of personally significant artwork onto the floors and walls of her studio. Surrounded by these images, she finds herself in “constant dialogue with a team” of artists including Michelangelo, Velázquez, De Kooning, Twombly, and Bacon (Luke and Saville 2020). Let us take a closer look at one of Saville’s more lengthy descriptions of this peculiar dialogue:

The conversation moves around. When I work, there will be art-history books all open on the floor of my studio. There will be a detail of a De Kooning painting, Picasso’s *Guernica*, Rembrandt’s *Descent from the Cross*, and a book that looks at the technique of Rubens, and all those images are buzzing around me at the same time. I sit down in between periods of painting and I look at images and make connections. The historical period in which a work was created has no relevance. Whether it’s a curve of a bull’s head from the caves of Lascaux or the loop of a breast on a De Kooning woman, if I see it, I can use it. I don’t see my conversation with artworks as a sequence, moving from here

to there in a conceptual way. I see the conversation as a poetic movement from eye to hand co-ordination, one which has an energy and potential for the way I work. (Marlow 2015.)

This quote contains several nuggets of information about using others' art to augment one's own. First of all, distributing the relevant visual resources across the studio enables the conversation to "move around" without predetermined patterns and aims. This, we submit, establishes a conducive environment for the discoveries that are crucial to open-ended creative work. As Saville reports, the visual elements that grab her attention and influence her paintings can be of almost any kind, regardless of style or historical period. Even so, the images "buzzing around" her studio are not random: they have been selected according to her personal sensibilities and ongoing artistic intentions, and thus feed and constrain her painting in a knowingly tailored manner. Finally, as befits the prevailing sense of fluidity, Saville's interactions with the images are nonsequential. There is no fixed plan or particular order for "moving from here to there," from image to painting. Rather, the fruitful connections between the two are consummated through a "poetic movement" incorporating "eye to hand co-ordination." This indicates that visual perception and fine motor skill coalesce to (partly) *constitute* ongoing associative thinking and artistic decision-making. We believe the relevant cognition is properly realized only once brush touches canvas, that is, in and through bodily engagement with the painting.³

Although Saville has a broad selection of imagery available in her studio, certain images tend to become more focal and impactful than others in her individual paintings. As she puts it, "I like to work in direct dialogue with a particular work, to really unlock it" (Cullinan 2020). For instance, in her *Self-Portrait (after Rembrandt)* from 2019, Saville chose to rely extensively on the Dutch master's *Self-Portrait with Two Circles* (c. 1665–1669), even eating her lunch looking at it. Saville recounts the impact of the image:

I had close-ups [of Rembrandt's self-portrait] around the painting, and he forced my hand to make much better tones than I've ever made before. In terms of pushing the tone, you look and look, and you think something has a particular tone, and then Rembrandt suddenly puts more light into the tone, and it creates air around the figure that's mysterious. And only from really looking at him did I then look at my own work and try to push in that way. ... I really like when I'm connected to a particular artist because it forces my hand to look more than I would have looked before. (Transcribed from Luke and Saville 2020)

Saville placed the Rembrandt reproductions around the painting so that she could see them while working. This type of arrangement established a direct and durable link between the image and the creative cognition running its course. In a striking choice of words, Saville describes Rembrandt's painting as forcing her *hand*, and not just her eyes, to *look* more attentively—again underlining the coalescence of visual perception and fine motor skill in painting. It is also worth noting that here the purpose of the image was relatively specific, namely, to help Saville achieve the right tones for her self-portrait. In this effort, the image played a twofold role. First, it provided a distinct set of visual information about suitable tonal solutions, thus narrowing down the range of possibilities worth pursuing, and second, it served as an exemplar of technical finesse, thus guiding the practical application of paint as well. All in all, Saville's account attests to the coupling of a carefully selected visual resource, the Rembrandt self-portrait, with a well-defined creative task, the discernment and implementation of optimal tonality in her painting. We maintain that, in this case, the functional integration was tight enough to generate a hybrid painter–image system possessing otherwise unattainable creative capacities. Without its emergence Saville could not have painted the tones that she did.

There are of course countless other ways in which painters integrate others' artworks into their own practice and paintings—for example, as knowing "winks" to art history or as "moves in an unfolding 'art game'" (Myin and Veldeman 2011). But whichever way existing artworks are used in the studio, they constitute just a fraction of the mass of visual resources available for exploitation. Painters also depend on ordinary photographs, aesthetically appealing objects, self-made models, and other such items to support their creative cognition. Smartphones and tablets have made it easier than ever to save and access useful imagery. To complement her archive of art books and reproductions, Saville too takes digital photos of graffiti, live models, shadows and light, tire marks on the road, and even the stains on her studio floor to scaffold her work (Luke and Saville 2020; Shaw 2020).

In a similar way, artist Vesa-Pekka Rannikko has reserved an entire wall in his studio for pertinent visual material:

On that wall is image material, I'm just starting on new things. I just collected images

and put them on the wall to get started from. The first time I used this wall as a mind map was last autumn. I drew and wrote on it and collected all kinds of other things on there. I like working that way and I like that it's a wall and not paper. It's some kind of space related memory construction ... it's nice that everything is on display at once. It's a work method I'd like to develop, it's connected to the studio, to the act of working physically. (Rope 2012, 108)

In the customary sense, Rannikko's description of the wall as a "mind-map" refers to the representation of information in associative visual form. But from an ecological and situated point of view, it also evinces the notion of his mind *being mapped onto* that information, forming a coupled system that effectively props up the task of "getting started." As with Saville, the cognition enabled by this kind of coupling becomes fully manifest in the "act of working physically," that is, in embodied thinking-in-action. To add to that, Rannikko also refers to his wall of images as a "space related memory construction." This indicates that remembering one's creative options and intentions can become deeply dependent on the resources available in the studio niche. It is to such scaffolding of painting-related memory that we now turn in more detail.

III.B. Mnemonic Scaffolds for Painting

Impromptu painting aside, painters usually make some kinds of plans for their paintings, especially with regard to composition, color scheme, subject matter, etc. Some artists also plot out practical aspects of their work, for instance by coordinating in advance the execution of key tasks. The more complex and extensive these plans are, the more there is to keep in mind. To deal with these demands, painters *offload* parts of the remembering process onto the environment or, to put it in scaffolding terms, employ customized studio resources to support and enhance their memory. A common way to do this is to make sketches and designs that store critical information and thus serve as cues for carrying out the work as intended. By returning to Saville's practice, we next discuss several methods of mnemonic scaffolding in the studio.

Like most professional artists, Saville paints for upcoming exhibitions. This poses a distinct challenge: "If I'm doing a big show and I've got a whole body of work, say I've got twenty works on the go, I forget what I'm doing on each piece when I'm working on them all at the same time" (Luke and Saville 2020). To cope with the situation, Saville has come up with a simple solution: she attaches notes to her paintings. As she explains it,

The sequencing of the way I put the paint down, in order to keep the painting as open as possible for as long as possible, becomes very important. You know, because I like to paint thick, if I'm doing a lot of moving around of the image, you have to keep the paint quite thin early on. So, the sequencing, I work that out, and that goes on the clipboard, so I know when I look at it: 'wait, where was I' ... Because I just forget, so I write notes (...) 'make it look like the paint is raining', 'draw through the rain', I'll write notes on it like that. (Transcribed from Luke and Saville 2020)

Overall, Saville's transcriptional system upholds the thick-on-thin approach to painting that she prefers. But more importantly, the individual notes help her to remember what is going on—and what still needs to be done—within the *sequential structure* of each particular piece. This allows her to move flexibly between paintings without fear of forgetting "where she was" on any single unfinished work. To add to this, Saville's notes contain evocative descriptions of how the paint should look or behave on canvas—as the prompt "make the paint rain" aptly illustrates. Thus, the notes not only facilitate the painting of simultaneous works but also function as *stylistic* reminders that help her achieve the desired visual effects.

With the writing of notes, Saville has found an effective way to offload parts of her ongoing artistic plans and intentions onto the studio environment. But the mnemonic utility of this textual resource does not end there:

The other thing I do is I write reports on my paintings when I finish them. It's not on the painting itself, it's on how I made that work—as a sort of improvement guide, because sometimes during the painting I can take a different direction ... I photograph all the time on my iPad, and I look later on—like six months later I'll say 'Shit, it was so much better at this point, why didn't I go down there? What made me go that way?' That started me writing notes about the painting, saying 'when you get to that stage again, stop, and work on something else, and then work out how to make that move, that painting.' It's so that I remember to take a different direction or be braver or something like that, because I just forget. (Transcribed from [Luke and Saville 2020](#))

Here the notes again play a crucial role in remembering, but over a different timescale. By *looking back* at how she painted particular pieces, Saville seeks to ensure the success of her works in the *future*. This temporally extensive endeavor relies on two kinds of remembering, which in turn rely on two different mnemonic resources. In the first place, the digital photos enable her to recollect what her paintings were like at different stages along now completed creative processes. These photos in turn inform the writing of reports that remind her of the directions to take, or not to take, in other (future) paintings with similar issues.

In sum, Saville customarily depends on external scaffolds to remember *what* she wants to paint and *how* she wants to paint it. The cognitive burden of keeping these things in mind is distributed across the studio itself. This method serves to re-emphasize that the know-how and capacities that underlie creative acts do not reside solely in the brains or bodies of the agents performing them. As a final example of this fact, we next discuss how music can scaffold the creative process.

III.C. Scaffolding Painting through Music

In addition to using existing artwork and memory aids, many painters also use music to support the creative process. Initially, this might seem unsurprising. Music is a central part of everyday life. We play music when cooking and eating, exercising, writing an academic paper, playing sports, hosting a party, or participating in religious rituals. And we routinely use music to regulate our attention and emotions. We create self-styled “auditory bubbles” for privacy on the subway or in open-plan office settings ([Dibben and Haake 2013](#)), and craft personalized soundtracks to shape our emotions ([Skånland 2013](#)). Music helps us share feelings and experiences with others and coordinate our joint actions ([Clarke, DeNora, and Vuoskoski 2015](#); [van der Schyff and Krueger 2019](#)). It is, in short, a powerful driver of actions, emotions, and empathy.

For our purposes, the key takeaway is that music is often more than background decoration. It is something we *do things with*. It is materialized in an array of artifacts, shared environments, and practices that afford different forms of manipulative engagement. When we interact with these artifacts and environments—such as when playing a musical instrument ([Roberts 2015](#)), say, or listening to a self-curated playlist on our smartphone ([Skånland 2013](#))—the dynamics of these engagements establish tightly-coupled, self-stimulating feedback loops in which we offload some of the regulative processes responsible for the emergence and control of our affective and attentional responses in that context. In this way, music can, and often does, function as a persistent form of environmental scaffolding (see [Krueger 2014](#) and [2019](#) for further discussion, including empirical details of this process). Importantly, we use different forms of musical scaffolding to manipulate physical and social spaces—we play specific kinds of music to set the right atmosphere and behavior at a party, waiting room, restaurant, worship space, or yoga studio—as well as create individualized sound worlds nested *within* these spaces (e.g., “auditory bubbles” in open-plan office settings).

For many painters, music plays an important role within the studio. We find vivid descriptions of how music scaffolds both the affective arousal and the attentional focus needed to drive the creative process over multiple timescales. Consider, for example, how Jarmo and Rauha Mäkilä respond to music in their studios. “Music evokes a feeling that attaches itself specifically to the motor aspect of doing,” observes Jarmo, while Rauha says that her choice of music depends on the medium she is working with: “When I painted with acrylics, I had to have upbeat music on, kind of like being in a disco the whole time. With oil colors, it has to be calm, something that helps you to focus” ([Viljanen 2013](#); authors' translation). Similarly, when asked if music plays an important role in her practice, Julie Mehretu replies,

Most definitely. Sometimes it affects the rhythm of where I am on a piece. I listen to different kinds of things depending on what I am working on, but really the music is a vehicle to remove myself from what I am doing, to get lost and get into that zone. Sometimes I listen to one album for the entire process of making one piece. (Fig 2009, 131)

We find similar reports from Jenny Saville. However, unlike many artists who listen to music constantly, she is more selective about when and how she uses it. During the day when her energy and concentration are high, she often does not need to listen to music. But things change when working at night, that is, “when I’m looser and tend to make more mistakes or take more risks.” Then, she says, “I’m pretty ruthless with music. I use music as a way to get into the right mood for what I want.” In the context of her creative work, Saville is clear that she sees music as a *tool*. This is because in the studio, she relates to music differently than in other listening contexts. When using it while painting, she confesses that “[I’m] not very kind to music, I don’t give it the credit it deserves.” What this seems to mean is that the music itself (i.e., its content, status, or value as an aesthetic object) is not her primary focus. Rather, the painting she’s working on is. So, this shift in how she relates to music means that it is approached primarily as a resource, as something available to bring into use. Music is a vehicle for accessing the painting in a mode of heightened engagement. Saville listens *through the music and into the painting*. Within the studio, then, music is experientially present with a kind of transparency (“the music has to stay somewhere slightly away from me, psychologically”). If it becomes a thematic focus, it is a distraction (“I can’t think about it too much”) (Luke and Saville 2020). For Saville and other painters, music is in this way experienced as part of a broader network of available tools and environmental resources—again, things like brushes, paint, images of other artworks, mnemonic aids—that can be summoned to scaffold and sustain the creative process.

How does music play this scaffolding role, exactly? Echoing reports we find from other painters—as well as other contexts of use, as we see in a moment—Saville provides some clues. She tells us that the *repetition* and *predictability* of music are key: “If anybody were in my studio they would just be going completely crazy because I can listen to one single piece of music for the whole duration of an artwork, or even for a show” (Luke and Saville 2020). By listening to the same piece of music again and again, Saville sets up a sonic niche that both occludes external distractions (e.g., traffic noise, outside voices, etc.) and furnishes a stable and predictable sound environment requiring minimal attention, saving her attentional resources for other things (e.g., the artwork). Music also allows Saville to further *customize* her creative space. Different musical works (Radiohead, Nirvana, “days of Beethoven,” Philip Glass, Jay-Z, etc.) are attached to different paintings (Luke and Saville 2020); they support the affective and attentional needs required to meet the creative demands of that specific moment and artwork.

We can fill in some details of this picture even further by looking at how music plays a similar scaffolding role in other activities. Consider how music is used to drive exercise or manual labor (Karageorghis and Terry 1997; Robinson 2005, 395–405). Music is known to sharpen and sustain our attentional focus (Sridharan et al. 2007), which can be helpful when working through strenuous activities. However, music can also reduce how difficult strenuous activity *feels*. It not only masks unpleasant proprioceptive feedback one gets during exertions by directing our attention away from unpleasant sensations and bringing about a calming effect by reducing muscle tension and increased oxygenation. It also functions as a kind of *surrogate agency*: a “musical agency,” as Thomas Hans Fritz and co-authors (2013) term it. Music directly modulates affect and behavior on the listener’s behalf by providing ongoing feedback in the form of “virtual goals”: dynamic representations of movement possibilities “with anticipatable but adaptable endpoints” that enable listeners to “regulate and monitor the extent and the timing of their movements more effectively” (Fritz et al. 2013, 17788). In this way, music assumes an external regulative (i.e., scaffolding) function. Rhythmic structures keep time for the listener and play an agential role in shaping musically induced expressions and movement patterns, for example, via rhythmic accentuations, increased or decreased tempo, etc. that propel them through their strenuous activity. Along with whatever additional positive physiological effects music may have, this offloading reduces the listener’s cognitive burden and, predictably, lowers her feeling of perceived exertion since she now has one less thing to worry about and can direct her attention elsewhere.

Something similar seems to happen in the painter's studio. Recall that "music evokes a feeling that attaches itself specifically to the motor aspect of doing," according to Jarmo Mäkilä; similarly, Julie Mehretu says that music "affects the rhythm of where I am on a piece." Saville also ascribes a motor function to musical scaffolding: "It's just there to serve a kind of rhythm... a background rhythm" (Luke and Saville 2020).

Crucially, musical scaffolding elicits and shapes the development of various *action-possibilities*, that is, creative trajectories and associations that lead to new and potentially unforeseen developments within the construction of the painting. Again, Saville provides helpful insight into this process: "Musical sounds... how music is composed, became very important for me as a way to construct a painting." The realism of Jay-Z's music, for instance, furnishes gritty, concrete qualities that she can "lock into... I like the rhythm of it at night" (Luke and Saville 2020). But the "repetitions of sounds and layerings," the tones and textures of the music—in addition to its lyrical content—also drive new visuomotor associations and creative connections.

A way to characterize what is happening here, we suggest, is to see the painter and music as coming together to form a "collaborative aesthetic agency." This idea deserves more treatment than we can give it here. But it stems from some previous observations: namely, the tight link between the form of our musical engagements and the way we construct, experience, and manipulate different aspects of our agency—including our creative agency—*within* these musical engagements. As Tia DeNora puts it, music is a technology of the self: "a resource for modulating and structuring the parameters of aesthetic agency – feeling, motivation, desire, comportment, action style, energy" (2000, 53). The key point is that music furnishes ongoing resources that allow painters to experiment, in various ways and at multiple timescales, with different forms of creative agency. This experimentation has consequences for *what* sort of painting emerges as well as *how* that painting emerges. By "locking into" musical environments while painting, each with distinct "sounds and layerings" and rhythmic dynamics, painters can temporarily inhabit agential structures that allow them to experiment with and explore structures of *their own* agency. This is because distinct musical environments (Bach, Jay-Z, Philip Glass, Nirvana) modulate feeling, motivation, desire, comportment, action style, attention, and energy in different ways. And these distinct musically guided aesthetic parameters, in turn, generate new interpretive and compositional possibilities relative to whatever piece the painter is working on at that moment. They are vehicles for engaging with the canvas in new and hitherto unimagined ways.

In sum, reports such as these indicate that, within the studio, musical scaffolding can have several functions. Music helps individuals demarcate their studio space as *their* creative space, block out environmental distractions by creating a customized auditory environment conducive to work, and provide a steady stream of sonic resources that helps to organize affect, attention, and creative energy. Music also feeds into and shapes the creative process itself by providing an immersive environment in which painters can try on and experiment with new modes of aesthetic agency.

IV. CONCLUSION

We have now applied the concepts of niche construction, scaffolding, and coupling to illuminate environmentally situated creativity in novel ways. Our analysis has revealed studios to be multi-resource niches that are customized by artists to scaffold various capacities, states, and actions crucial to painting. When at work in their studios, painters do not need to rely solely on their "inner" powers of imagination, memory, and technique to execute paintings. Instead, with the help of carefully selected resources, they can enact different forms of creative agency and offload elements of creative mentation and action onto the studio niche.

We have focused specifically on three resources used by painters to scaffold creativity: existing artworks, memory aids, and music. In doing so, we have discussed the studio primarily as a materially structured niche and concentrated on real-time painter-resource interactions. To fill in the picture, numerous other resources relevant to studio-bound creativity could be considered, including the studio's architectural configurations and the painter's use of models, advisers, assistants, and the like. And to achieve an even broader view, the analysis could be extended to include the ways in which studio niches and their occupants' artistic practices are themselves embedded in wider social, cultural, and conceptual-normative niches. To give just one example, trans-generationally transmitted

and modified notions of what constitutes good painting—and *painting as an art* in itself—are all likely to scaffold artistic work in various ways. Niche construction theory, we suggest, provides excellent means to investigate these issues further.⁴

JUSSI A. SAARINEN, Department of Social Sciences and Philosophy, University of Jyväskylä, Jyväskylä, Finland. Email: jussi.a.saarinen@jyu.fi

JOEL KRUEGER, Department of Sociology, Philosophy, and Anthropology, University of Exeter, Exeter EX4 4RJ, United Kingdom. Email: j.krueger@exeter.ac.uk

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END NOTES

- 1 It is worth mentioning that niche construction theory has already been used in aesthetics and creativity research in various ways (see, e.g., Menary 2014; Malinin 2016; Richards 2017; Wheeler 2018; Portera 2020; Saarinén 2020a). These studies aptly illustrate the diverse conceptualizations and applications of niche construction theory to date.
- 2 There is a longstanding debate whether or not high functional integration constitutes an *extension* of the mind, which literally means that extra-bodily elements or "vehicles" come to partly constitute the mental states, capacities, or processes in question. Although one of the authors of this article has systematically argued in favor of extension, we will not elaborate on this issue here. For further discussions of the topic as regards artistic creativity and aesthetics, see, for example, Myin and Veldeman (2011), Wheeler (2018) and Nannicelli (2019).
- 3 In this respect, Saville's practice instantiates a form of *embodied cognition*, in which the agent's beyond-the-brain body has both causally significant and physically constitutive roles to play in cognitive processing.
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