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Aesthetic Flow: The Implications and Neural Correlates of a Goal-Directed Aesthetic Experience

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ABSTRACT
This paper offers an argument for the existence of a type of goal-directed aesthetic experience. By weaving together recent research in the fields of philosophy, psychology, and neuroscience, I show how an artists in flow experience—a necessarily goal-directed mental state—can nevertheless have aesthetic experiences (Csikszentmihalyi 1991; Csikszentmihalyi 1996; Dietrich 2004; Ulrich et al. 2014). Recent approaches to understanding aesthetic experiences from the perspective of neuroscience have suggested that a non-goal-directed (or disinterested, in Kantian terms) mental state is needed to achieve an aesthetic experience (Kant 2009; Brincker 2014). Contrary to this, I will argue that aesthetic experiences can occur in the context of goal-directed states.

KEYWORDS
Aesthetic Perception, Flow State, Disinterest, Artists

INTRODUCTION

Simply put, flow state is the feeling of being "in the zone."[1] Experts in nearly any skill-based activity describe experiences in which they felt completely immersed in the task at hand, with a sense of control over their actions without "thinking" about them. Examples of flow vary from music ensembles executing difficult music with extreme precision for extended periods of time, to assembly line workers being able to construct their units in record time. Flow state allows for explicit thought in relation the agent's actions to be bypassed, removing the risk of failure due to not being able to "think" fast enough (Dietrich 2003, 746-761; Csikszentmihalyi 1991, 36-49).[2]

The connection between flow state and the aesthetic experience lies within the creative state of the performer. A number of psychological studies have illuminated how musicians and songwriters have aesthetic reactions to their work while in flow. In a study of musical therapy techniques, a survey of highly trained musicians revealed that they felt a "higher desire to experience and express feelings through music [during flow]" (Woody and McPherson 2011, 405). Subjects who composed original songs during flow reported meaningful emotional responses to their art in the moment of creation as a result of the experience. These studies went on to suggest that subjects who are able to achieve deeper flow states while playing music or writing a song will have stronger and more meaningful experiences while creating (Baker and Macdonald 2013, 131-140; Baker, MacDonald, and Pollard 2018, 17-19). Woody and McPherson's 2011 study focused on the group flow state that occurs between musicians in an ensemble setting. During this type of flow experience, musicians were quoted explaining their emotional reactions to the structural components of the music they just played as "lovemaking," being "high," or in "ecstasy" (Woody and McPherson 2011, 405). The emotion and meaning experienced by these artists during the moment of creation is clear evidence of an aesthetic response during flow. Their aesthetic states appeared to be a response to their own and other's creations, as well as perceptions of their external environment. This evidence demonstrates that some flow states can constitute aesthetic experiences. And, if flow is a necessarily goal-directed mental state, then it must also be true that some aesthetic experiences are goal-directed

1. Throughout this paper, I use flow, flow state, and flow experience interchangeably.

2. *Agent* and *Performer* will also be used synonymously throughout this paper.

mental states (Woody and McPherson 2011; Baker and Macdonald 2013; Baker, MacDonald, and Pollard 2018).

In a 2015 article, Maria Brincker developed a theory that proposes a neurological explanation of Kant's disinterested aesthetic experience. To have an aesthetic experience, Kant argues, we need to get our minds into a state of "free play," where our imagination can take its course due to scaled back cognition. Brincker argues that the disinterested states described by Kant are necessarily non-goal-directed. So, we must get our mind out of a practical, goal-directed state before we can have a disinterested brain state; only then do we have the chance to have an aesthetic experience. Though disinterest seems to be a part of how our brains approach the aesthetic state, it does not account for the contexts of all of our aesthetic experiences. As a goal-directed state in which we execute practical thinking and have the opportunity for aesthetic experiences, flow provides a counterexample to Brincker's claim (Csikszentmihalyi 1991, 39-40; Dietrich 2004, 746; Kant 2009, 198; Brincker 2014, 5). The aesthetic moments one can experience during flow state calls for a reassessment of the breadth of Brincker's argument.

FLOW STATE

For a person to get into flow, the defining characteristics of the mental state, first identified by psychologist Mihaly Csikszentmihalyi, must be fulfilled (Csikszentmihalyi 1991, 39-41, 66-67):

1. The skill/challenge balance.
2. Goal-orientation.
3. Immediate feedback to one's actions.
4. Absorption.

Once fully immersed in the experience of their task, the performer begins to undergo the characteristic phenomenological experiences of flow:

1. A mitigation of self-consciousness.
2. Subsequent eliminations of processing the experience of time, worry of failure, and distractions.
3. Autotelic feelings related to the performed task.

TRANSIENT HYPOFRONTALITY THEORY

Flow experience involves a continuous interaction between perception, lower level information processing, and the skills responsible for the execution of the task. These functions span what some neuroscientists call the "implicit" and "explicit" systems of the brain. The implicit system, which is located primarily within the basal ganglia and the larger networks it belongs to, is responsible for skill-based knowledge and efficiency, while the explicit system is responsible for executive function, self-consciousness, and cognitive flexibility. Dietrich's proposed explanation of flow experience is that the brain enters a state of "transient hypofrontality," temporarily blocking the self-conscious and self-analytical functions of the explicit system. Transient hypofrontality theory has been confirmed by observations of decreased regional cerebral blood flow in the dorsolateral prefrontal cortex (DLPFC) and the medial prefrontal cortex (MPFC)--areas of our brains responsible for self-conscious and -analytical processing--during flow conditions (Dietrich 2004, 746, 748-750; Ulrich et al. 2014, 199).

Transient hypofrontality does, however, allow for the cognitive flexibility and "sustained and direct attention" from the DLPFC to be activated. The resulting state is a trade-off between the efficiency of the implicit system and the flexibility of the explicit system. When acting on a task during flow, the implicit system's routine skills are merged with the explicit systems novel approach to a task. In music, for example, the jazz musician's implicit skills are informed by the technique she has developed practicing the transcriptions of "the greats" she's played hundreds of times. Their practiced musical vocabulary forms a bank of skills to draw from and is supported by the basal ganglia and procedural memory. The cognitive flexibility afforded by the explicit system allows for novel approaches to the note "choices" around those licks while improvising over the song's chord changes. These functions achieved by brain networks provide a sense of constant interaction between processing of incoming information and the agent's output in the task at hand, equating to a high level of focus, and the feeling of being "in the zone" (Csikszentmihalyi 1991, 41; Dietrich 2004, 746, 748-750; Ulrich et al. 2014, 199).

THE SKILL/CHALLENGE BALANCE

Flow experience requires a happy medium between the challenge of the task and the agent's skill set. If this isn't satisfied, the ability to get into, or maintain a flow state can be interrupted. If a melody is perceived to be too difficult, and broke our musician out of flow, they would need to engage their executive functions, i.e. their explicit thinking, for however brief a time, to try to re-enter flow. At the other end of this continuum, are those tasks which are not challenging enough and do not present the need for novel and semi-demanding action. Because of the lack of perceived challenge, the explicit and implicit systems don't achieve transient hypofrontal interaction, which can lead to daydreaming or a similar state (Dietrich 2004, 757). Furthermore, boredom is a highly self-conscious state in which the person knows that "what *I am* doing right now is not stimulating." This is not to say that ostensibly boring tasks themselves cannot be used to begin to enter into a flow experience, but rather an example of a self-conscious state that has the ability to end flow conditions (Csikszentmihalyi 1991, 39). In a 2014 study, Ulrich et al. were able to observe the skill/challenge condition during induced flow experiences. They found that neural activity in the inferior frontal gyrus (IFG), an area aligned with adaptation to task goals, peaked when presented with the optimal level of difficulty during flow (Ulrich et al. 2014, 199).

ATTENTIONAL REQUIREMENTS

Focused attention must be sustained until complete absorption is achieved in the task at hand in order to have a flow experience. In this way, the process of concentration involved in attaining flow is very similar to the process used to enter a meditative state. This highlights the idea that the attentional systems are still involved in flow, but their function and experience are highly specific and specialized. Therefore, understanding the agent's concentration as *absorption* in their task, rather than sustained attention, is much more useful. This description gets at to the unique relationship between information processing and output, which includes the processing of multiple perceptions at the same time without self-conscious and executive interference. We can thus identify the state of absorption during flow as deeply related to transient hypofrontality, which is also responsible for the loss of the sense of self and time due to the shutdown of

nearly all of the MPFC and DLPFC (Morita et al. 2008; Dietrich 2003, 243, 244; Csikszentmihalyi 1991, 66-67).

GOAL ORIENTATION

A series of nested goal-directed mental states are necessary to achieve flow experience. An agent's actions must have clearly defined goals every step of the way, which are often combined with larger overarching goals. For example, while playing a song, a musician has the small, clearly defined goals of playing the right note after each note for the duration of the song. Each note gets built into a melodic line, which, when compounded, expresses the entirety of the song's form, further expanding the breadth of their smaller goals. All the while, she has the overarching goal of playing the song to completion (Csikszentmihalyi 1991, 39-40; Dietrich 2004, 757; Ulrich et al. 2014, 3530-3532, 3540-3543).[3]

AUTOTELIC ACTIVITY

According to Csikszentmihalyi, activity which results in flow states results in the intrinsic, self-contained benefit of the task. This concept in flow is called the autotelic experience, meaning that the activity is an end in itself. By playing the saxophone with their group for the sake of creating and interacting with other musicians and audience members, the musician is focused on the benefits only found by the very of performing the activity. Conversely, if the saxophone player was playing only for the prospect of acquiring prestige, fame, and money, they would be focused on the "exotelic" results of the action. Therefore, Csikszentmihalyi argues, even though the product and execution of both situations are completely the same--playing the song successfully--the saxophone player who is going into the activity focused on exotelic results does not achieve the intrinsic benefit that is attributed to flow experiences. The problem with Csikszentmihalyi's analysis of the exotelic approach is that it disregards the agent's ability to achieve flow experiences based purely on the skill based, goal-oriented, and attentional aspects of flow. Positive feelings in response to flow states have been reinforced by neuroscientific analysis;

3. These studies found that the goal-directed determinant of flow correlated with increased regional cerebral blood flow to the putamen, which is involved in guiding and coding goal-directed action.

however, these results were independent of what each subject's autotelic and exotelic attitude on the tasks performed. Therefore, it appears that the autotelic aspect of flow may not be as necessary as previously outlined by Csikszentmihalyi (Csikszentmihalyi 1991, 39-40, 66-67, 111-113; Dietrich 2004, 757-758; Dietrich 2003, 243, 244; Ulrich et al. 2014, 194, 198, 200).

CHARACTERISTIC MENTAL STATES

The sharp decrease in self-conscious processing during flow can be attributed to the low levels of neural activity in the MPFC and DLPFC. Since the mind does not have the ability to have additional self-conscious information brought into the flow experience without exiting the flow state, distractions, the fear of failure, the self-critic, and extraneous content, are eliminated from perception. Flow, however, is not unbreakable and can be interrupted by external stimuli. If an audience member is acting belligerent, yelling, or throwing tomatoes at the performer, this would surely be enough to break the musician out of their flow experience. Tomato throwing aside, low to mid-level distractions, like chatter throughout the audience or a loud conversation, would not be enough to break a seasoned performer's flow experience. Distortion of time during flow experience is a hallmark of the flow state condition. Our perception of time is handled by the DLPFC. When the mind enters transient hypofrontality during flow, the portions responsible for temporal perception are shutdown. This is what accounts for musicians who often recall playing or practicing for hours on end without any clue to how long (or short) of a time they've been playing (Ulrich et al. 2014, 195, 200; Dietrich 2004, 756-758).

AESTHETIC MOMENTS DURING FLOW STATE

The individual musician's need to listen to themselves or the rest of the ensemble that they're playing with gives them the ability to have aesthetic responses to both their own sounds and the sounds of the group. Aesthetic experiences constituted by flow are non-cognitive due to the all but complete shut-down of the MPFC and DLPFC. So, to the musician with their group, the aesthetic flow perception would come across as the feeling of just "beautiful," or "groovin'," rather than the propositional thought of "this melody sounds beautiful," or "the drummer is groovin'." The first example makes internal, non-

thought-like reference to the external sounds the group is creating. Due to the high level of relevant information processing in flow, the first example is an aesthetic perception, with no *explicit* reference to the self or other individuals involved. Conversely, the second example is cognitive, as the musician makes a reference to herself in relation to events in the external world, as well as a reference to other individuals (Woody and McPherson 2011, 405).

DISINTERESTED AESTHETIC EXPERIENCES VS. AESTHETIC FLOW STATES

Disinterest is a concept proposed by Immanuel Kant in his 1790 work, *Critique of Power and Judgment*. Kant argues that a level of psychological distance is required during the aesthetic experience to allow our imagination to interpret the art as an art object, as well as have "free play" in our minds (Kant 2009, xxix, 102, 198). Using a neuroscientific approach, Maria Brincker's aesthetic stance hypothesis plays on these themes formulated by Kant. Brincker claims that a non-goal-oriented mental state is the necessary link that allows us to access "free play," in turn allowing "deeper subjective involvement," or "freedom of imagination" (Brincker 2014, 5).

Brincker connects her neurological analysis of disinterestedness with correlating brain states, claiming that deactivation of executive function causes the brain to enter a non-practical mode, while an active DMN is the connection to the "free play of imagination" (Brincker 2014, 25). At first glance, this claim appears to be true. The executive system is responsible for a majority of what we qualify as practical, goal-oriented function. Examples of these actions could be writing a paper, organizing, prioritizing, maintaining focus, and other tasks which require critical thinking. DMN activity is used when we are daydreaming, doing mental time travel, aren't partaking in any particular task, or thinking of ourselves and our relation to others. All of these activities can be easily correlated with freedom of imagination.

Brincker's application of neuroscience to her hypothesis sought to outline the brain conditions of being an aesthetic beholder and show how those conditions were in stark contrast to a goal-directed mental state. Studies on the neural landscape of deep aesthetic experiences continue show increased DMN activity (Reybrouck et al. 2018; Vessel et al. 2012, 1-17; Vessel et. al. 2013, 258-275).

However, shutdown of the DMN during flow states display that there is not a necessary correlation between activity in the default system and the aesthetic experience (Ulrich et al. 2014, 195-200). The previously mentioned musicians and songwriters also showed that they were able to have meaningful aesthetic moments during flow--a state of non-activity in the DMN. The possibility for aesthetic perception during flow shows how the conditions of being an aesthetic perceiver are not necessarily in contrast to goal-oriented attitudes. Transient hypofrontality interaction during flow bypasses executive function within a goal-directed state, demonstrating how our minds are capable of creating the constitutive states for an aesthetic experience even while we may hold a more "practical attitude" (Dietrich 2004, 756-758; Brincker 2014, 21).

CONCLUSION

The possibility for aesthetic perceptions during flow shows that there is no mutually opposing dynamic between goal-directedness and aesthetic perception. In fact, flow experience integrates our ability to access the complex emotional processing of an aesthetic experience while maintaining a practical, task-oriented attitude. In contrast to Brincker's claims, aesthetic flow illuminates how a-typical brain systems can constitute an aesthetic experience depending on the mental state of the agent. In the future, comparing the brain systems active during aesthetic flow with the systems normally active during an aesthetic experience could delineate a framework for where the aesthetic experience exists in the brain as a whole. It is my hope that this paper can be used as a call for further interdisciplinary engagement into flow state's effects on the aesthetic experience, as well as further inquiries into the combination of philosophy and neuroscience as a whole.

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