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## Recreating Copyright: The Cognitive Process of Creation and Copyright Law

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### Cover Page Footnote

Visiting Researcher, University of California at Berkeley School of Law; Research Fellow, Edmond J. Safra Center for Ethics, Buchmann Faculty of Law, Tel Aviv University; Research Fellow, Zvi Meitar Center for Advanced Legal Studies, Buchmann Faculty of Law, Tel Aviv University. This Article is based on a chapter from my PhD dissertation written under the supervision of Professor Michael Birnhack, Zvi Meitar Center for Advanced Legal Studies, Buchmann Faculty of Law, Tel Aviv University. This research was supported by a scholarship from the S. Horowitz Institute for Intellectual Property in Memory of Dr. Amnon Goldenberg, Buchmann Faculty of Law, Tel Aviv University. I wish to thank Michael Birnhack for his invaluable comments, suggestions, and support and for reading earlier drafts of this Article. I also wish to thank Mark Lemley, Orly Lobel, Peter Menell, Shai Lavi, and David Heyd for very helpful discussions on this Article; participants of the Edmond J. Safra Center for Ethics Turn of the Year Workshop 2015 for their comments and lead commentator Dotan Oliar for his thorough reading of a draft of this Article and for his great comments; the participants of the Sixth Annual Workshop of the Israeli Forum on IP; the participants of the Corporate Innovation and Legal Policy Seminar at the University of San Diego; and the participants of the Buchmann Faculty of Law PhD Colloquium for their thoughtful comments. Last, but definitely not least, I wish to thank Asaf Wiener and Ohad Somech for countless conversations on this Article and for always reading and discussing my drafts.

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Omri Rachum-Twaig\*

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## INTRODUCTION

Copyright law reflects the intuitive understanding of creativity in the eyes of the law. This is because copyright law's primary goal is to promote creativity.<sup>1</sup> But is the legal understanding of creativity in line with cognitive psychology's understanding of the creative process? This Article examines whether copyright law is harmonious with cognitive psychology's understanding of creativity. Some scholars posit that theories of creativity fit well with current copyright law. In an article published in the *Harvard Law Review*,

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<sup>1</sup> See U.S. CONST. art. I, § 8, cl. 8 (providing that Congress has the power "[t]o promote the Progress of Science . . ."); see also *Twentieth Century Music Corp. v. Aiken*, 422 U.S. 151, 156 (1975) (noting that copyright's "ultimate aim" is "to stimulate artistic creativity for the general public good"); *Kelly v. Arriba Soft Corp.*, 336 F.3d 811, 820 (9th Cir. 2003) ("The Copyright Act was intended to promote creativity, thereby benefitting the artist and the public alike."); *Warner Bros. Inc. v. Am. Broad. Cos.*, 720 F.2d 231, 240 (2d Cir. 1983) ("It is a fundamental objective of the copyright law to foster creativity."); Julie E. Cohen, *Creativity and Culture in Copyright Theory*, 40 U.C. DAVIS L. REV. 1151, 1151 (2007) ("Creativity is universally agreed to be a good that copyright law should seek to promote . . ."); Ned Snow, *The Regressing Progress Clause: Rethinking Constitutional Indifference to Harmful Content in Copyright*, 47 U.C. DAVIS L. REV. 1, 40 (2013) ("[I]n no uncertain terms the Court has articulated a view of copyright that defines the primary objective of copyright as creativity or originality (which turns on creativity).").

Joseph Fishman, a scholar studying the relationship between intellectual property and creativity, argued that, based upon some accounts of creativity, copyright law's constraints on creativity actually push authors to create more original and creative works.<sup>2</sup> This Article's goal is to offer a broader assessment of creativity studies and to question whether they indeed fit with copyright law's assumptions about creativity.

This Article focuses on four main doctrines and concepts in copyright law. The first is the originality requirement in copyright law.<sup>3</sup> The second is the concept of romantic authorship. The third is the idea/expression dichotomy that grants copyright protection to expressions and denies it to ideas.<sup>4</sup> The fourth, which is closely related to the third, is the right to make derivative works.<sup>5</sup> Copyright law treats derivative works separately from original works and creates, to some extent, an identity between derivative works and reproductions.<sup>6</sup> This attitude toward derivative works is not easy to justify. This Article examines whether the cognitive psychology of creativity is consonant with this legal doctrine and how to best apply cognitive psychology's findings to the law.

The copyright doctrines discussed in this Article are based upon implicit and explicit assumptions about creativity. The originality doctrine, for example, is based upon the express assumption that creative works include an original contribution from the author.<sup>7</sup> By contrast, the idea/expression dichotomy has a more implicit assumption about creativity; it assumes that ideas are more important to the promotion of creativity than expressions. This implicit assumption is evidenced by different normative approach-

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<sup>2</sup> See Joseph P. Fishman, *Creating Around Copyright*, 128 HARV. L. REV. 1333, 1360–90 (2015). Fishman's argument is based upon the "path of least resistance" approach to creativity and empirical studies based upon it. *Id.* This Article discusses this approach to creativity as part of its broader theory of creative cognition, along with other approaches to creativity. See *infra* Section IV.B.

<sup>3</sup> See 17 U.S.C. § 102(a) (2012).

<sup>4</sup> See § 102(b) ("In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work.").

<sup>5</sup> See *id.* § 103(a).

<sup>6</sup> See *id.*

<sup>7</sup> See § 102(a).

es to copyright law, such as utilitarian analysis and natural rights theories, which suggest that non-protection of ideas is necessary for promoting creativity and that the protection of expression is harmful to creativity.<sup>8</sup> The exclusive right to make derivative works is based upon a similar assumption. Under a utilitarian analysis, authors are properly granted an exclusive right to make derivative works, if we assume an original author's incentive to create derivative works promotes creativity that outweighs the creativity that would result from second authors' free access to preexisting expressions as the basis for their works.<sup>9</sup> In other words, the law assumes that the free making of derivative works is less important for promoting creativity than preserving the first author's incentive to create "original" works.

This Article contends that the law's idea/expression dichotomy, which requires the same standard of review for both derivative works and reproductions, is not justified under cognitive psychology's understanding of the creative process. During the cognitive process of creation, authors utilize their prior knowledge to crystallize abstract thoughts into new ideas. Specifically, authors employ domain-relevant knowledge and memory as building blocks in their creative process. Cognitive psychology posits that both ideas and expressions (in copyright terms) are possible knowledge components that creativity is based on and identifies both types of knowledge as an inherent part of the creative process. This Article's argument focuses on the descriptive-critical level, and argues that as far as the distinction between derivative works (based on expressions of previous works) and original works (that are based on abstract ideas or unprotected expressions) is concerned, there is a mismatch between copyright law and cognitive psychology's understanding of creativity. In fact, it is possible that the basic

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<sup>8</sup> For an economic analysis of the idea/expression dichotomy, see WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW* 91-92 (2003). For a Lockean justification for the idea/expression dichotomy, see Wendy J. Gordon, *A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property*, 102 *YALE L.J.* 1533, 1581-83 (1993), and Justin Hughes, *The Philosophy of Intellectual Property*, 77 *GEO. L.J.* 287, 310-14 (1988).

<sup>9</sup> For an economic analysis of the derivative work right, see LANDES & POSNER, *supra* note 8, at 108-15. For a critique on this analysis, see *infra* note 384.

idea/expression dichotomy in copyright law is also discordant with cognitive psychology. Although a shift to a new copyright regime is premature, a normative reevaluation of the legal justifications underlying the current regime is proper, considering this Article's conclusions. Additionally, the findings suggested in this Article could be used as a basis for a normative discussion under various approaches in the absence of other empirical data about the effects current copyright law has on creativity.

Literature on the cognitive psychology of creativity includes theoretical literature as well as empirical and historical studies that seek to outline the various cognitive stages of the creative process and the common pattern of creativity identifiable in authors' cognitive process. This Article reviews the existing literature on the cognitive psychology of creativity, discusses its main characteristics, and extracts several substantial notions about the various stages of the creative process and the importance of previous knowledge and memory in the creative process. These notions demonstrate that there is a gap between the way the law understands derivative work and its place in the creative world. This gap warrants a reevaluation of the legal justifications underlying the exclusive right to make derivative works, the scope of this right, and the remedies for infringement.<sup>10</sup>

The notion regarding the centrality of prior relevant knowledge in the creative process, and its role as a knowledge component for both ideas and expressions, is one of the grounds on which this Article argues that the law should conceptually separate mere reproductions from the making of derivative works under copyright. Whereas mere reproductions are properly considered uncreative by cognitive psychology and the law, derivative works are the result of creative activity that is not qualitatively different from making an "original" work. To reflect this distinction between creative and

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<sup>10</sup> It is important to note that, although this Article argues that copyright law and the right to make a derivative work right should be analyzed in light of the cognitive understanding of creativity, the creative process—even in its cognitive context—is fluid and not predefined. It is likely that the cognitive process of creation is affected by various factors that are external to the author and only one of these factors may be the law. Nevertheless, the law's effect on creativity should be scrutinized in order to maximize the law's efficacy.

non-creative activities, copyright law should separate the reproduction right from the derivative work right.

In addition, two other aspects of cognitive psychology could illuminate copyright law. First, the cognitive psychology of creativity could contribute to a better, more precise understanding of copyright law's originality requirement. Copyright should embrace psychology's understanding that not every creative product should be considered entirely original. The second concerns copyright's requirement of an independent contribution by the author. Post-modern copyright law purportedly utilizes a definition of independent contribution that is significantly narrower than the "romantic author" approach, the predecessor to copyright's current understanding of an independent contribution, which was criticized as too broad.<sup>11</sup> The cognitive process of creativity strongly suggests that although a work of authorship has many sources external to the author, the author nevertheless has an independent contribution that cannot be disregarded.

Before delving into the core arguments, it is important to outline several characteristics of cognitive psychology's discourse on creativity. First, this field does not distinguish between creative activities that concern works of authorship in copyright terms and creative activities that concern inventions in patent law terms. Therefore, when necessary, this Article articulates the differences that may arise in light of this lack of differentiation. Second, the meaning of many terms in cognitive psychology is different from both common parlance and legal terminology. Two main terms warrant explanation here: The field of cognitive psychology uses the terms "problem" or "task" to refer to the goal driving the author's creative process.<sup>12</sup> Put differently, these terms mean the task that the creative activity revolves around.<sup>13</sup> The creative environment in which the creative process takes place is referred to as a "domain," and this Article uses the term "task-domain" often. This term means the creative environment relevant to the task the author seeks to complete. Another important point is the meaning

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<sup>11</sup> See *infra* notes 364–72 and accompanying text.

<sup>12</sup> See Todd I. Lubart, *Models of the Creative Process: Past, Present and Future*, 13 *CREATIVITY RES. J.* 295, 297 (2001).

<sup>13</sup> See *id.*



of the term knowledge. In cognitive psychology, knowledge includes various components of information. Some of these may appear to copyright experts as ideas in their legal sense. However, as this Article points out, the term *knowledge* in cognitive psychology includes informational components that reflect *expressions* in the copyright sense.<sup>14</sup>

This Article is organized in the following manner: Part I discusses cognitive psychology's relevance to the law. Part II presents the predominant theories of the process of creation and emphasizes the main characteristics of each group of theories. Part III divides the cognitive process of creation into two main stages: the stage of abstract unfocused ideation, and the stage of crystallization of a preliminary idea using previous domain-relevant knowledge and memory. Part IV uses theoretical, empirical and historical research to explain the role of prior domain-relevant knowledge and memory in the process of creation. Finally, Part V discusses how the discourse of cognitive psychology and the notions extracted from it may affect copyright law and, specifically, the right to make derivative works.

## I. COGNITIVE PSYCHOLOGY AND THE LAW

A short discussion about the relevance of cognitive psychology to the law and the connection of these two fields of knowledge is appropriate. This discussion obviously has implications for the validity of the relationship between cognitive psychology of creativity and copyright law as this Article suggests. When a connection between the law and an extralegal field of knowledge is suggested, the first question to ask is what the relations between the two are. One

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<sup>14</sup> Two disclaimers are appropriate. First, this Article is not advocating for a direct link between the use of prior knowledge and memory in the creative process and the creation of derivative works in the legal context. In this sense, it does not argue that every work of authorship is a derivative work because many works are based upon knowledge that the law treats as a mere idea. The claim is limited to the argument that making derivative works—i.e., using prior knowledge that contains explicit protected expression as part of the creative process—is an inherent part of the creative process and is not qualitatively different from making an original work with preexisting “ideas.” Second, this Article does not suggest that the law’s distinction between original works and derivative works is impossible to justify normatively. Instead, this Article posits that this distinction is discordant with cognitive psychology’s understating of creativity.

option is a relation of subordination, meaning that the law should adapt itself to notions from the extralegal field. A second option is a relation of description, explanation, and projection, meaning that the extralegal field explains the law and the legal rules and describes their effects on the real world. A third option, sometimes derived from the second, is a utilitarian relation, meaning that the extralegal field could be used as a tool to design rules that will best achieve the law's goals.<sup>15</sup> The relation between the law and an extralegal field is derived from that field's characteristics and theoretical goals. If the extralegal field has a normative goal, the first type of relation is concerned. If, on the other hand, the extralegal field has a descriptive goal, then the second or third relations are relevant. This is demonstrated by the relation between economics and psychology, and the relation between both and the law.

As far as economics is concerned, the neoclassical economic theory could be viewed as normative because it proposes a maxim of good that people should adhere to. This normative maxim of wealth maximization is based on the Benthamian approach that "it is the greatest happiness of the greatest number that is the measure of right and wrong."<sup>16</sup> A more concrete conceptualization of wealth maximization is the sum of subjective individual preferences. To apply the normative aspect of the economic theory, economists developed a secondary theory that is mostly descriptive. Thus, for example, the neoclassical economic theory assumes that human beings behave rationally.<sup>17</sup> This assumption serves as a foundation for explaining and predicting the conditions that will maximize the sum of private preferences. Mathematical tools, such as formal models could inform how this normative maxim is best fulfilled.

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<sup>15</sup> For a similar analysis, see Christine Jolls, Cass R. Sunstein & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 *STAN. L. REV.* 1471, 1474 (1998), which suggests that different approaches to the law could be positive, descriptive, or normative, and Cass R. Sunstein, *Behavioral Analysis of Law*, 64 *U. CHI. L. REV.* 1175, 1177 (1997). Steven Shavell, for example, recognized that the economic analysis in the context of law has a normative aspect as well as a descriptive one. See STEVEN SHAVELL, *FOUNDATIONS OF ECONOMIC ANALYSIS OF LAW* 1-2 (2004).

<sup>16</sup> JEREMY BENTHAM, *A FRAGMENT ON GOVERNMENT* vi (1776).

<sup>17</sup> See, e.g., Daniel Kahneman, *New Challenges to the Rationality Assumption*, 150 *J. INSTITUTIONAL & THEORETICAL ECON.* 18, 18 (1994).

Cognitive psychologists claim their field has an explanatory and descriptive purpose, which follows from its place in the natural sciences, as this branch of science aims to describe phenomena in the world. Cognitive psychology seeks to examine and explain how people perceive and process information.<sup>18</sup> The scientific aspect of the field is best demonstrated by reviewing the names of its subfields, such as experimental cognitive psychology, cognitive sciences, and cognitive neuroscience.<sup>19</sup> Cognitive neuroscience, which examines the relationship between cognitive processes and biological processes in the human brain, is a clear example of cognitive psychology's explanatory and descriptive purpose.<sup>20</sup> Additionally, in the remaining subfields of cognitive psychology, the declared research methodology is empirical and the aim of the researchers is to describe and explain information processing.<sup>21</sup>

The combination of economics and psychology—cognitive psychology, specifically—and of both with the law, demonstrates the different types of relationships discussed above. After refusing to acknowledge psychology as science for decades, economic theory began to absorb notions from the field of cognitive psychology in the second half of the twentieth century.<sup>22</sup> This led to the development of behavioral economics, an economic theory that reviews basic assumptions and premises in neoclassical economics in order to develop better and more accurate assumptions.<sup>23</sup> For example, behavioral economics challenges the rationality assumption, which holds that human beings behave rationally to maximize their wealth and is an integral component of neoclassical econom-

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<sup>18</sup> See MICHAEL W. EYSENCK & MARK T. KEANE, *COGNITIVE PSYCHOLOGY: A STUDENT'S HANDBOOK* 1-3 (4th ed. 2000); Keith J. Holyoak, *Psychology*, in *THE MIT ENCYCLOPEDIA OF THE COGNITIVE SCIENCES* xxxix (Robert A. Wilson & Frank C. Keil eds. 1999).

<sup>19</sup> See EYSENCK & KEANE, *supra* note 18, at 3.

<sup>20</sup> See *id.* at 16-17; Thomas D. Albreit & Helen J. Neville, *Neurosciences*, in *THE MIT ENCYCLOPEDIA OF THE COGNITIVE SCIENCES*, *supra* note 18, at li.

<sup>21</sup> See EYSENCK & KEANE, *supra* note 18, at 3-12.

<sup>22</sup> See Colin F. Camerer & George Loewenstein, *Behavioral Economics: Past, Present, Future*, in *ADVANCES IN BEHAVIORAL ECONOMICS* 3, 5-7 (Colin F. Camerer & George Loewenstein eds., 2004).

<sup>23</sup> See *id.* at 7.

ics.<sup>24</sup> However, behavioral economics and notions from the field of psychology did not lead to the rejection of the normative premises of neoclassical economics, which are centered on achieving wealth maximization.<sup>25</sup> This is because principles of psychology have influenced only the theoretical level of economics, which is descriptive and explanatory rather than normative.

This is evident in the legal context as well. The basic premises of neoclassical economics entered the legal field and led to the development of economic analyses of law.<sup>26</sup> Economic theory was applied to law in two aspects as well, normative and descriptive. Thus, the economic analysis of law is based on the underlying normative standpoint that society should strive for wealth maximization.<sup>27</sup> Additionally, the economic analysis of law as a descriptive enterprise assumes—as neoclassical economics does—that human beings behave rationally. This assumption underlies economic analyses' predictions about human decision-making and the outcome of different legal rules.<sup>28</sup> Notions from psychology (and cognitive psychology, specifically) entered the legal field primarily under the economic analysis of law as a descriptive and explanatory theory. Thus, the same notions about human behavior that substituted the rationality assumption (and others) in neoclassical economics were applied to law to import behavioral economics to the legal context.<sup>29</sup> Here, too, the psychological notions had nothing to do with the normative aspect of the discussion; instead, only descriptive and explanatory psychological principles were applied to the law.<sup>30</sup>

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<sup>24</sup> See generally Kahneman, *supra* note 17; Amos Tversky & Daniel Kahneman, *Rational Choice and the Framing of Decisions*, 59 J. BUS. 251 (1986); Amos Tversky & Daniel Kahneman, *The Framing of Decisions and the Psychology of Choice*, 211 SCI. 453 (1981).

<sup>25</sup> See Camerer & Loewenstein, *supra* note 22, at 3.

<sup>26</sup> See, e.g., SHAVELL, *supra* note 15, at 4.

<sup>27</sup> See *id.* at 1-4; see also Richard Posner, *Utilitarianism, Economics, and Legal Theory*, 8 J. LEGAL STUD. 103, 119 (1979).

<sup>28</sup> See SHAVELL, *supra* note 15, at 4.

<sup>29</sup> See, e.g., Jolls, Sunstein & Tahler, *supra* note 15; Sunstein, *supra* note 15.

<sup>30</sup> See generally Richard A. Posner, *Rational Choice, Behavioral Economics, and the Law*, 50 STAN. L. REV. 1551 (1997) (critiquing the application of behavioral economics to the law by arguing that behavioral economics does not suggest a new normative maxim that neoclassical economics did not account for). This criticism is overstated because the purpose of importing behavioral notions into both economics and law was not normative; rather, it satisfied explanatory and descriptive goals.

The study of creativity within cognitive psychology is a scientific field that seeks to describe and explain the cognitive processes underlying creative behavior.<sup>31</sup> The scientific aspect of creativity research is evident in many empirical studies, conducted under various methodologies, that aim to explain and measure different aspects of creative behavior.<sup>32</sup> The theoretical goal of this Article is to evaluate notions about creativity from the field of cognitive psychology and to use them as explanatory and descriptive tools to improve copyright law. Like the psychological notions in economic analysis, the discussion in this Article does not suggest an independent normative theory of copyright. However, the data and findings presented in this Article could lead to a better understanding of the existing legal rules that govern creative behavior and their relation to human behavior, and, thus, to a better application of existing normative approaches to the law.

## II. THE CREATIVE COGNITION—THEORIES

The birth of the modern understanding of the cognitive process of creation is attributed to British psychologist Graham Wallas and his book *The Art of Thought*, which was published in 1926.<sup>33</sup> In his

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<sup>31</sup> See, e.g., Robert J. Sternberg & Todd I. Lubart, *The Concept of Creativity: Prospects and Paradigms*, in HANDBOOK OF CREATIVITY 3, 7 (Robert J. Sternberg ed., 1999) [hereinafter HANDBOOK OF CREATIVITY 1999]. For a critical analysis of whether creativity studies are scientific, see Robert T. Brown, *Creativity: What Are We to Measure?*, in HANDBOOK OF CREATIVITY 3, 6–8 (John A. Glover, Royce R. Ronning & Cecil R. Reynolds eds., 1989) [hereinafter HANDBOOK OF CREATIVITY 1989].

<sup>32</sup> For a discussion of research measuring creativity, see Dennis Hocevar & Patricia Bachelor, *A Taxonomy and Critique of Measurements Used in the Study of Creativity*, in HANDBOOK OF CREATIVITY 1989, *supra* note 31, at 53, and Jonathan A. Plucker & Joseph S. Renzulli, *Psychometric Approaches to the Study of Human Creativity*, in HANDBOOK OF CREATIVITY 1999, *supra* note 31, at 35. For a discussion of empirical research based on experimental studies, see Mark A. Runco & Shawn Okuda Sakamoto, *Experimental Studies of Creativity*, in HANDBOOK OF CREATIVITY 1999, *supra* note 31, at 62. For a discussion of the biological aspects of creativity and cognitive neuroscience research, see Arne Dietrich, *The Cognitive Neuroscience of Creativity*, 11 PSYCHONOMIC BULL. & REV. 1011 (2004); Colin Martindale, *Biological Bases of Creativity*, in HANDBOOK OF CREATIVITY 1999, *supra* note 31, at 137; and Keith Sawyer, *The Cognitive Neuroscience of Creativity: A Critical Review*, 23 CREATIVITY RES. J. 137 (2011).

<sup>33</sup> See GRAHAM WALLAS, *THE ART OF THOUGHT* (1926). Creativity was discussed in ancient times as well. Plato and Aristotle, for example, discussed the sources of creativity, and in ancient Greece, the Greeks believed that Zeus and his nine daughters, the muses,

book, Wallas described various cognitive stages of the creative process that became the basis for current theories of creativity. In the second half of the twentieth century, cognitive psychologists strived to develop a comprehensive model of the creative process. This Part presents the predominant theories of the cognitive process of creation. In addition to outlining these approaches, this Part shows that, despite their differences, they all dedicate significant discussion to authors' use of prior domain-relevant knowledge, memory, and heuristics in the creative process. For this purpose, this Part uses the taxonomy offered in the field of cognitive psychology for the different approaches,<sup>34</sup> while referring to original literature and additional scholarship in order to conceptualize different approaches to the creative process.

#### *A. Stage and Componential Process Theories*

The modern stage and componential approaches to creativity are a direct continuation of Wallas' scholarship, and therefore, to understand them, it is important to first describe his stage theory of creativity. Wallas hypothesized that four stages formed the creative process: preparation, incubation, illumination, and verification.<sup>35</sup>

The preparation stage consists of a preliminary identification of the problem or task at hand and its definition.<sup>36</sup> Conscious thinking, reliance on the author's prior knowledge, expertise, and analytical capabilities, and other components that draw from the au-

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were the source of creative thought. See ROBERT W. WEISBERG, *CREATIVITY: UNDERSTANDING INNOVATION IN PROBLEM SOLVING, SCIENCE, INVENTION, AND THE ARTS* 90–92 (2006). In modern times, the beginning of scholarly thought about creativity is attributed to Sigmund Freud and Henri Poincaré, who saw the source of creativity in unconscious thinking. See *id.* at 92–94.

<sup>34</sup> See Aaron Kozbelt, Ronald A. Beghetto & Mark A. Runco, *Theories of Creativity*, in *THE CAMBRIDGE HANDBOOK OF CREATIVITY* 20, 30–35 (James C. Kaufman & Robert J. Sternberg eds., 2010).

<sup>35</sup> See WALLAS, *supra* note 33, at 80.

<sup>36</sup> See *id.* at 82–84. The literature on cognitive psychology typically uses the term “problem” to describe the beginning of the creative process. The meaning of this term is not identical to its common meaning; instead, it is more closely related to the term “task.” The term refers to a wide range of instances that could lead to creative activity, whether it is a specific professional or logical problem that needs to be solved, and whether it is the beginning of a task (professional, artistic, scientific or otherwise) that is ill-defined. See Lubart, *supra* note 12, at 297. This Part uses the terms “problem” and “task” to describe the task an author pursues during the creative process.

thor's domain-relevant knowledge, characterize this stage.<sup>37</sup> The incubation stage is characterized by a lack of conscious thought about the task, and the author often consciously engages in other problems and tasks.<sup>38</sup> At this stage, unconscious processes occur, which consist mainly of associative thinking and the combination of ideas.<sup>39</sup> In the illumination stage, a promising idea breaks into the consciousness of the author, who identifies that an idea is crystallizing in his mind intuitively.<sup>40</sup> Finally, in the verification stage, the author works consciously and examines, refines, and develops the idea that passed into his consciousness during the illumination stage.<sup>41</sup> The author also examines the validity of the idea and crystallizes it into its exact form.<sup>42</sup>

Wallas' stage theory was the basis for empirical studies that sought to verify his theory. In addition, the theory was the basis for more elaborate theoretical models in the same spirit.<sup>43</sup> However, Wallas' division to four stages was too vague to account for the various characteristics of the creative process, and his focus on the different components included in each stage lacked detail.<sup>44</sup> For example, Wallas did not explain the relationship between the different stages or their significance and position in the creative process.<sup>45</sup> In addition, Wallas did not explain the sub-processes of each stage, which was particularly problematic for the incubation stage.<sup>46</sup> One of the most significant models that was developed on the basis of Wallas' stage theory in order to fill in the gaps was Teresa Amabile's componential model to creativity, which was first

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<sup>37</sup> See WALLAS, *supra* note 33, at 82–84 (describing the author at the preparation stage as an “educated” person who is proficient in distinguishing between ideas and memory encoding, and has gathered a wide spectrum of facts that allow him more associative possibilities); see also Lubart, *supra* note 12, at 296.

<sup>38</sup> See WALLAS, *supra* note 33, at 86.

<sup>39</sup> See *id.*

<sup>40</sup> See *id.* at 97.

<sup>41</sup> See *id.* at 81.

<sup>42</sup> See *id.*

<sup>43</sup> See, e.g., Sandra E. Moriarty & Bruce G. Vandenberg, *Advertising Creatives Look at Creativity*, 18 J. CREATIVE BEHAV. 162, 166 (1984) (identifying Wallas' four stages through a qualitative survey of advertisers' work); see also Lubart, *supra* note 12, at 297 (classifying Amabile's approach as a continuation of Wallas' work).

<sup>44</sup> See Lubart, *supra* note 12, at 299.

<sup>45</sup> See *id.* at 298–99.

<sup>46</sup> See, e.g., *id.*

introduced in her book *The Social Psychology of Creativity*, published in 1983,<sup>47</sup> and later updated in her 1996 book, *Creativity in Context*.<sup>48</sup>

Amabile, as well as Wallas, suggested four main stages in the creative process. Her first stage is the problem or task presentation stage.<sup>49</sup> This stage comes into play when the author is highly motivated to identify a problem or to engage in a task, or when the problem or task are presented by an external entity.<sup>50</sup> The second stage is the preparation stage, which Amabile defined as the stage where the author constructs or activates a task-relevant knowledge database.<sup>51</sup> When the author has sufficient task-relevant knowledge and expertise, this stage may be significantly shortened.<sup>52</sup> The third stage is the response generation stage in which the author generates possible responses to the task or problem by searching, consciously or unconsciously, for possible solution paths.<sup>53</sup> The fourth stage is the response validation stage, which Amabile described as the stage in which task-relevant knowledge and skills have a significant role.<sup>54</sup> In this stage, the potential generated responses are analyzed using existing knowledge and formed in a way that will fit the solution and be functional.<sup>55</sup>

In addition to her four stages, Amabile emphasized three cognitive components that come into play in each of the stages.<sup>56</sup> The first component, and the most important one for the purpose of this Article, is the domain-relevant skills component.<sup>57</sup> Amabile defined this component as one that contains all possible responses

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<sup>47</sup> See generally TERESA M. AMABILE, *THE SOCIAL PSYCHOLOGY OF CREATIVITY* (1983) [hereinafter AMABILE, *SOCIAL PSYCHOLOGY*].

<sup>48</sup> See generally TERESA M. AMABILE, *CREATIVITY IN CONTEXT* (1996) [hereinafter AMABILE, *CONTEXT*].

<sup>49</sup> See *id.* at 95.

<sup>50</sup> See *id.*

<sup>51</sup> See *id.*

<sup>52</sup> See *id.* This Article uses task-relevant knowledge to refer to knowledge that is relevant to the environment of the creative activity. This means the knowledge and expertise that are related to the specific creative environment and tradition.

<sup>53</sup> See *id.* at 55–56.

<sup>54</sup> See *id.* at 96.

<sup>55</sup> See *id.*

<sup>56</sup> See *id.* at 83.

<sup>57</sup> See *id.* at 85.



that the author can perceive.<sup>58</sup> A new response is generated from this pool of possible responses and then validated using task-relevant information and knowledge.<sup>59</sup> This component also includes the author's prior factual knowledge about the task-domain that consists of facts, principles, common paradigms, and aesthetic criteria, as well as technical abilities that are necessary for the task-domain.<sup>60</sup> She argued that there is significant importance in the way task-relevant knowledge is stored and coded; information coded by general principles will be more useful to the author than a bundle of facts with narrow applicability.<sup>61</sup> This component was identified by Amabile as mainly within the preparation and response validation stages.<sup>62</sup>

The second component Amabile identified is creativity-relevant skills.<sup>63</sup> She defined this component as the "something extra" that is required for creative activity.<sup>64</sup> It is what determines the amount that by which the new idea surpasses the old ideas that it is built upon.<sup>65</sup> Without creative-relevant skills, even authors with excellent task-relevant skills will be unable to create a new product.<sup>66</sup> Amabile offered the following set of characteristics to describe this component: the ability to break through common conceptions; the ability to develop new cognitive systems for problem solving; the ability to understand complex situations; the ability to maintain a wide range of available responses over time; suspension of response validation; the use of the widest categories possible; and precise memory and creative conception of works in the world.<sup>67</sup> This component includes knowledge about the task-

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<sup>58</sup> *See id.*

<sup>59</sup> *See id.*

<sup>60</sup> *See id.* at 85–86. This component includes knowledge of the general technique that is related to the relevant task and, more importantly, knowledge and familiarity with concrete previous instances that are related to the task and could be used to complete the relevant task. This means that the task-relevant knowledge also includes visual (or audible) memory of previous works known to the author. *See id.*

<sup>61</sup> *See id.* at 95.

<sup>62</sup> *See id.* at 95–96.

<sup>63</sup> *See id.* at 86–90.

<sup>64</sup> *See id.* at 86.

<sup>65</sup> *See id.*

<sup>66</sup> *See id.* at 88.

<sup>67</sup> *See id.* at 88–89.

relevant heuristics that could operate in both an explicit and conscious mode or in an implicit and unconscious one.<sup>68</sup> Amabile identified this component as related to the response generation stage.<sup>69</sup>

The third component Amabile identified is task motivation.<sup>70</sup> This component distinguishes between the author's inner task-motivation (i.e., the personal interest the author has in a specific task) and outer task-motivation (i.e., a social or professional constraint that obliges the author to engage with a specific task).<sup>71</sup> According to Amabile, while the first enhances creativity, the latter inhibits the author's creative abilities.<sup>72</sup> The motivation component affects both the task presentation and the response validation stages.<sup>73</sup>

In another example, cognitive psychologists Mark Runco and Ivonne Chand introduced a five-component model for creativity in 1995.<sup>74</sup> These components are divided into two tiers.<sup>75</sup> The first tier consists of problem finding, idea finding, and evaluation components.<sup>76</sup> The problem-finding component includes identifying and defining a problem or task, and the idea finding component reflects creativity and mental flexibility.<sup>77</sup> The evaluation component reflects critical thinking about an idea.<sup>78</sup> The second tier includes knowledge (divided into declarative and procedural knowledge) and motivation (divided into internal and external motivation).<sup>79</sup> Procedural knowledge refers to knowledge of strategies that facili-

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<sup>68</sup> See *id.* at 89. Amabile defined "heuristics" as any principle or instrument that contributes to the reduction of the average solution search time. See *id.* (citing Allen Newell et al., *The Processes of Creative Thinking*, in CONTEMPORARY APPROACHES TO CREATIVE THINKING: A SYMPOSIUM HELD AT THE UNIVERSITY OF COLORADO 63, 78 (Gruber et al. eds., 1962)).

<sup>69</sup> See AMABILE, CONTEXT, *supra* note 48, at 94.

<sup>70</sup> See *id.* at 90-93.

<sup>71</sup> See *id.* at 90-91.

<sup>72</sup> See AMABILE, SOCIAL PSYCHOLOGY, *supra* note 47, at 91.

<sup>73</sup> See AMABILE, CONTEXT, *supra* note 48, at 93.

<sup>74</sup> See Mark A. Runco & Ivonne Chand, *Cognition and Creativity*, 7 EDUC. PSYCHOL. REV. 243, 245 (1995).

<sup>75</sup> See *id.*

<sup>76</sup> See *id.*

<sup>77</sup> See *id.*

<sup>78</sup> See *id.*

<sup>79</sup> See *id.*

tate accomplishing task-relevant processes (i.e., know-how).<sup>80</sup> Declarative knowledge, on the other hand, refers to the author's factual knowledge.<sup>81</sup> Runco and Chand placed these components in the second tier because they contribute to the creative process more than they control it.<sup>82</sup>

Despite the similarities between Runco and Chand's and Amabile's models, some differences should be articulated. While Amabile attributed the task-relevant skills to the preparation and response validation stages, Runco and Chand argued that knowledge (declarative and procedural) affects not only the problem-finding stage, but also the idea finding stage.<sup>83</sup> This is significant because Amabile identified a stage in the creative process where prior knowledge has no contribution, whereas Runco and Chand posited that knowledge affects every stage of the creative process.<sup>84</sup>

The componential models to creativity were criticized on several grounds. First, because these approaches suggest a wide array of components that are interrelated, they were criticized due to lack of parsimony.<sup>85</sup> Second, the models are difficult to verify empirically because every component must be identified and measured separately to reach a valid conclusion.<sup>86</sup> Third, the approaches

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<sup>80</sup> *See id.* at 246.

<sup>81</sup> *See id.* It is important to emphasize that the term "factual knowledge" does not refer to facts in the copyright sense. The meaning of the term is visual, semantic, or symbolic knowledge that includes all task-relevant details in the author's memory. In this sense, factual knowledge could consist of informative factual knowledge as well as concrete expressions of preexisting task-related works. For example, when a painter seeks to paint a sunflower field, several types of knowledge could come into play. Procedural knowledge in this context includes painting methods and techniques, and the painter's professional abilities and expertise. Declarative knowledge in this context consists of several types of information as well. Simple facts include the painter's acquaintance with the sunflower and its visual form in nature. Another type of declarative knowledge is preexisting visual works use of sunflowers in different visual ways and any specific visual images of sunflowers.

<sup>82</sup> *See id.* at 245–46.

<sup>83</sup> *See id.* at 245.

<sup>84</sup> *See id.*

<sup>85</sup> *See* Todd I. Lubart, *Componential Models*, in 1 *ENCYCLOPEDIA OF CREATIVITY* 295, 299 (Mark A. Runco & Steven R. Pritzker eds., 1999).

<sup>86</sup> *See id.*

do not explain which stage or component is most important to creativity.<sup>87</sup>

Every one of the models in the stage and componential approaches dedicates significant attention to knowledge-based components throughout the creative process. In Wallas' theory, the use of prior knowledge is evident in both the preparation stage, when the author uses his previous education and knowledge, and the validation stage, in which the author validates the creative product in light of his task-relevant knowledge.<sup>88</sup> Under Amabile's approach, prior knowledge plays a significant role in task presentation, preparation, response generation, and validation.<sup>89</sup> In the preparation and validation stages, according to Amabile, the author uses his task-relevant skills, which include factual (semantic) knowledge.<sup>90</sup> Runco and Chand, for their part, emphasized the use of task-relevant declarative knowledge in every part of the creative process.<sup>91</sup>

Under each of these theories, the use of prior knowledge consists of various types of information that could be used as a basis for a work of authorship. Ideas (in their legal sense) are obviously included as well as methods, processes, and other abstract components that are essential to the creative process. However, the description of the task-relevant knowledge under these theories includes the use of knowledge components that reflect concrete and explicit expressions (in the legal sense) formed from works that are stored in the author's memory. Both types of knowledge could be the basis of creative activity under cognitive psychology.

Copyright law only partially matches the cognitive understanding of creativity. With respect to the use of prior knowledge in preliminary phases of the creative process—for example, in the input and processing phases (reflected in the preparation and incubation stages in Wallas' model,<sup>92</sup> or the preparation and response genera-

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<sup>87</sup> See *id.* at 289–99.

<sup>88</sup> See WALLAS, *supra* note 33, at 80, 86.

<sup>89</sup> See AMABILE, CONTEXT, *supra* note 48, at 94.

<sup>90</sup> See *id.*

<sup>91</sup> See Runco & Chand, *supra* note 74, at 248.

<sup>92</sup> See *supra* notes 35–39 and accompanying text.

tion stages in Amabile's model)<sup>93</sup>—copyright law allows the use of any type of knowledge that the theories consider. This is because copyright law is not interested in the preliminary phases of creativity. It is concerned only with the concrete final creative product: the output. With regard to the output, however, copyright law allows the use of ideas or unprotected expressions as the basis for creativity, but it does not allow the use of protected expressions (with some exceptions, including the fair use doctrine). This is in contrast to the approaches presented above that view expressions as relevant knowledge types for creativity in all of their phases.<sup>94</sup>

In addition, it is important to emphasize that Wallas and Amabile identified stages in the creative process where the author has an individual contribution and prior knowledge does not play a role.<sup>95</sup> This is evident in Wallas' illumination stage and in Amabile's response generation stage.<sup>96</sup> Even in Runco and Chand's model, which holds that knowledge affects every stage of the creative process, there is specific attention to the author's individual contribution to the creative process in the ideation stage.<sup>97</sup> These findings support copyright law's originality requirement, which affords copyright protection only when the author's expression displays a modicum of creativity original to the author.<sup>98</sup> This is in contrast to post-modern approaches that reject the "romantic author" approach.<sup>99</sup> In this sense, copyright law matches the cognitive understanding of creativity.

### B. *Creativity as a Cognitive Process*

Aaron Kozbelt, Ronald A. Beghetto, and Mark A. Runco, researchers in the field of cognitive psychology who study the crea-

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<sup>93</sup> See *supra* notes 48–53 and accompanying text.

<sup>94</sup> See *supra* notes 35–91 and accompanying text.

<sup>95</sup> See *supra* notes 35–73 and accompanying text.

<sup>96</sup> See *supra* notes 40, 53 and accompanying text.

<sup>97</sup> See *supra* notes 74–82 and accompanying text.

<sup>98</sup> See 17 U.S.C. § 102(a) (2012) ("Copyright protection subsists, in accordance with this title, in original works of authorship. . . ."); *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 346 (1991).

<sup>99</sup> The "romantic author" approach sees the individual author as the only source for any work of authorship and describes the creative process as an individual endeavor in which the work is created out of nothing. See *infra* Section V.B.

tive process, identified a group of theories that concentrates on cognitive processes that characterize the creative process, which they named “cognitive theories.”<sup>100</sup> These approaches aim to identify cognitive abilities and processes that are necessary for creative activity and focus on the process of creation and on the author.<sup>101</sup> The main difference between this group of approaches and the stage and componential theories is that the cognitive theories do not concentrate on the timeline of the creative process or on the chronological stage at which sub-processes take place. Instead, they focus on the type of cognitive processes that are relevant and necessary for creativity.

American psychologist J.P. Guilford, who tried to distinguish between divergent and convergent thinking, developed one of the most important models in this group of theories.<sup>102</sup> Divergent thinking refers to the unfocused process of associative thought that leads to different directions and may cause an original task-relevant idea to occur.<sup>103</sup> Convergent thinking, in contrast, occurs when cognition seeks to find a correct, applicable, and usable solution that fits task-relevant conventions, mainly using deduction.<sup>104</sup> At this stage, there is significant use of stored memory that affects the creative product.<sup>105</sup>

A similar model was suggested by John R. Suler who referred to two sub-processes in the creative process—primary and secondary—based upon principles of Sigmund Freud’s psychoanalysis.<sup>106</sup> The primary sub-process of thinking usually occurs unconsciously and was described by Suler as more primitive than the secondary sub-process.<sup>107</sup> During this sub-process, memories and past experiences mix together; thought is mainly metaphoric because the

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<sup>100</sup> See Kozbelt, Beghetto & Runco, *supra* note 34, at 31.

<sup>101</sup> *See id.*

<sup>102</sup> See J.P. GUILFORD, *THE NATURE OF HUMAN INTELLIGENCE* 138 (1967); *see also* WEISBERG, *supra* note 33, at 95-97.

<sup>103</sup> See GUILFORD, *supra* note 102, at 138.

<sup>104</sup> *See id.* at 171.

<sup>105</sup> *See id.* at 313-15.

<sup>106</sup> See John R. Suler, *Primary Process Thinking and Creativity*, 88 *PSYCHOL. BULL.* 144 (1980).

<sup>107</sup> *See id.*

borderlines between memories are fuzzy.<sup>108</sup> In contrast, the second sub-process is characterized by conceptual organization of memory.<sup>109</sup> In this sub-process, the author is able to access and control the unfocused thoughts developed in the primary sub-process and crystallize them into socially meaningful products.<sup>110</sup>

Liane Gabora, a researcher who contributed to this line of theories, observed that the creative process requires phases of unfocused and focused thought and the ability to combine the two.<sup>111</sup> Gabora's significant contribution in this context is the use of tools from neuroscience and the cognitive sciences to propose a biological conceptualization of these processes.<sup>112</sup> Gabora explained that the human memory is "stored" in neurons and each neuron is responsible for the storage of several memories.<sup>113</sup> Each memory is split between different neurons.<sup>114</sup> Access to stored memories depends on contextual stimulations; a specific stimulation activates a group of cells containing various neurons that respond to the stimulation.<sup>115</sup> Gabora argued that in a state of unfocused thought many cell groups and their respective neurons, which are otherwise inactive, are activated.<sup>116</sup> These excess neurons are referred to as "neurds."<sup>117</sup> Thus, Gabora proposed that the purpose of unfocused thought is to gather neurds to use as a solution for the relevant task or problem.<sup>118</sup> The relevant neurons will pass through to the focused thought and the author will use them to crystallize a concrete idea.<sup>119</sup> According to this approach, which was named the

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<sup>108</sup> *See id.*

<sup>109</sup> *See id.* at 145.

<sup>110</sup> *See id.* at 145–46.

<sup>111</sup> *See* Liane Gabora, *Revenge of the 'Neurds': Characterizing Creative Thought in Terms of the Structure and Dynamics of Memory*, 22 *CREATIVITY RES. J.* 1 (2010).

<sup>112</sup> *See id.* at 3.

<sup>113</sup> *See id.*

<sup>114</sup> *See id.* at 5.

<sup>115</sup> *See id.* at 5–6.

<sup>116</sup> *See id.* at 9.

<sup>117</sup> *See id.* at 12.

<sup>118</sup> *See id.* at 9.

<sup>119</sup> *See id.*

“honing theory of creativity,” unfocused thought leads to original but impractical ideas that are honed using focused thought.<sup>120</sup>

Ronald A. Finke, Thomas B. Ward, and Steven M. Smith presented a different theory of creativity called the “Geneplore” model in 1992.<sup>121</sup> The name of the model is derived from its main two processes, generate and explore, which that are subject to constraints that depend on the creative product.<sup>122</sup> Fink, Ward, and Smith defined the model as more heuristic than explanatory, and said its aim is to show that most creative activities could be described in terms of primary production of potential ideas followed by thorough research of these ideas.<sup>123</sup> Different types of idea production processes include restoring memory structures, creating simple associations from these structures, and recombining them or transferring the memory structures to new forms.<sup>124</sup>

It is important to clarify that the term “ideas” in the context of the Geneplore model does not have the same meaning as the equivalent legal term; rather, it refers to the production of any part of the creative product.<sup>125</sup> Different types of exploration processes include the search for new characteristics of mental structures, the search for compatible metaphors, the search for new operability of existing memory structures, and the evaluation of the potential to use them in different contexts.<sup>126</sup> This model does not distinguish between generation and exploration processes and posits that the author switches between different modes many times throughout the creative process.<sup>127</sup> Finally, the Geneplore model assumes that the relevant task or the end product can cast constraints on both

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<sup>120</sup> See Nicholas Davis & Ellen Yi-Luen Do, *Quantifying the Artistic Experience with Perceptive Sketching Tools: Cognitive Technologies to Support Creativity Researchers*, 22 *COMUNICAÇÃO & SOCIEDADE* 76, 80 (2012).

<sup>121</sup> See RONALD A. FINKE, THOMAS B. WARD & STEVEN M. SMITH, *CREATIVE COGNITION: THEORY, RESEARCH AND APPLICATIONS* 17–43 (1992).

<sup>122</sup> See *id.* at 17–28.

<sup>123</sup> See Thomas B. Ward, Steven M. Smith & Ronald A. Finke, *Creative Cognition*, in *HANDBOOK OF CREATIVITY* 1999, *supra* note 31, at 189, 191.

<sup>124</sup> See FINKE, WARD & SMITH, *supra* note 121, at 20; Ward, Smith & Finke, *supra* note 123, at 191–92; Lubart, *supra* note 12, at 299–300.

<sup>125</sup> See Ward, Smith & Finke, *supra* note 123, at 191.

<sup>126</sup> See FINKE, WARD & SMITH, *supra* note 121, at 26; Lubart, *supra* note 12, at 299–300; Ward, Smith & Finke, *supra* note 123, at 191–92.

<sup>127</sup> See Ward, Smith & Finke, *supra* note 123, at 191.



processes at any point during the creative process.<sup>128</sup> An example of such constraints is restricted resources of limited operability.<sup>129</sup>

These approaches best illustrate the general division of the creative process into two sub-processes: the unfocused phase, in which abstract ideas are created,<sup>130</sup> and the focused phase, in which the ideas are crystallized into concrete form.<sup>131</sup> Guilford, Suler, and Gabora made an explicit division between these two stages: They showed that the focused phase of creativity is characterized by utilizing prior task-relevant knowledge and memory.<sup>132</sup> Guilford and Gabora stressed that stored memory plays a crucial part in creativity.<sup>133</sup> Though they did not explicitly define whether this use of memory includes ideas or expression in copyright terms, they did refer to the use of complete memory units,<sup>134</sup> and it is more than likely that such a use consists of both ideas and expression. Finke, Ward, and Smith, for their part, showed that knowledge and memory play a significant role in every phase of creativity.<sup>135</sup> In addition, the idea generation part of their model is specifically characterized by the restoration of existing memory structures and recombination in order to produce new creative products.<sup>136</sup> Here, too, there was reference to the use of preexisting expression (in copyright terms) as a basis for creativity, since these memory structures are capable of bearing concrete expressions as well as ideas. When a memory structure that holds task-relevant preexisting works is restored, it is more than likely that it will contain expressions rather than mere ideas.<sup>137</sup>

A substantial match between the cognitive approaches to creativity and copyright law is evident here as well. Copyright law allows the use of many types of knowledge and memory components

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<sup>128</sup> See, e.g., *id.*

<sup>129</sup> See FINKE, WARD & SMITH, *supra* note 121, at 26.

<sup>130</sup> See *id.* at 17.

<sup>131</sup> See *id.*

<sup>132</sup> See GUILFORD, *supra* note 102, at 108, see also WALLAS, *supra* note 33, at 81; Gabora, *supra* note 111, at 3; Suler, *supra* note 106, at 144–45.

<sup>133</sup> See GUILFORD, *supra* note 102, at 139; Gabora, *supra* note 111, at 14.

<sup>134</sup> See GUILFORD, *supra* note 102, at 116; Gabora, *supra* note 111, at 9–10.

<sup>135</sup> See FINKE, WARD & SMITH, *supra* note 121, at 20.

<sup>136</sup> See *id.* at 20–21.

<sup>137</sup> See FINKE, WARD & SMITH, *supra* note 121, at 20; Lubart, *supra* note 12, at 299–300; Ward, Smith & Finke, *supra* note 123, at 191–92.

for the crystallization of unfocused ideas into concrete creative products.<sup>138</sup> Among these are abstract ideas (or methods, facts and processes) as well as unprotected expression (in the public domain or by fair use).<sup>139</sup> However, as far as the use of protected expressions during the output phase of creativity is concerned, there is a mismatch between copyright law's derivative work right and the cognitive theories of creativity.

Similar to the discussion of theories about the stages of creativity, the creative cognition theories focus on the independent contribution of the author to the creative product. Notably, Guilford, Suler, and Gabora's models included a phase of unfocused cognition that is not related to the use of prior knowledge.<sup>140</sup> It also appeared in the Geneplore model, which articulated the independent cognitive features of the author that are not attributed to prior knowledge.<sup>141</sup> In the context of copyright law, these theories have implications on the romantic author discourse and on the originality requirement.<sup>142</sup> Later sections show that the division to two main sub-processes is also compatible with other theories of creativity.

### *C. Creativity as Problem Solving*

One of the most significant theories on the process of creation posits that it is a problem-solving process.<sup>143</sup> However, in contrast to classical problem solving, where the goal is known but the paths to the solution are not, this theory holds that the creative process is characterized by ill-defined goals and problems.<sup>144</sup> Further, al-

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<sup>138</sup> See 17 U.S.C. § 103 (2012). *But see id.* § 102(b).

<sup>139</sup> See § 103. *But see* § 102(b).

<sup>140</sup> See GUILFORD, *supra* note 102, at 315; Gabora, *supra* note 111, at 9; Suler, *supra* note 106, at 146.

<sup>141</sup> See generally FINKE, WARD & SMITH, *supra* note 121.

<sup>142</sup> See *infra* Section V.B.

<sup>143</sup> See Kozbelt, Beghetto & Runco, *supra* note 34, at 33.

<sup>144</sup> See *id.* (defining creativity as an ill-defined problem-solving process); Lubart, *supra* note 12, at 297 (stating that the term "problem" in the creative context also refers to a task that the author wishes to engage in); see also JACOB W. GETZELS & MIHALY CSIKSZENTMIHALYI, *THE CREATIVE VISION: A LONGITUDINAL STUDY OF PROBLEM FINDING IN ART* 84 (1976); David Collins, *A Synthesis Process Model of Creative Thinking in Music Composition*, 33 *PSYCHOL. MUSIC* 193, 195 (2005); Yingxu Wang, *On Cognitive Foundations of Creativity and the Cognitive Process of Creation*, 3 *INT'L J. COGNITIVE INFORMATICS & NAT. INTELLIGENCE* 1, 2 (2009) [hereafter Wang, *Cognitive Foundations*];

though there may be cases in which there is no problem at all, it is usually possible to split ill-defined problems into well-defined sub-problems in a way that fits the classical model of problem-solving theory.<sup>145</sup> Kozbelt, Beghetto, and Runco also noted that these approaches focus both on the creative process and the author—the former because these approaches deal with common cognitive psychology approaches that refer to the representation of problem and heuristic searching, and the latter by emphasizing the expertise that is required from the author in the specific task-domain.<sup>146</sup>

Guilford suggested one of the first models of creative problem solving.<sup>147</sup> His model was based on several main recursive stages that are connected with intermediary processes that affect the problem-solving process.<sup>148</sup> The first stage Guilford proposed is the filtering stage, during which the author's attention is directed to a specific input.<sup>149</sup> The next stage is cognition, in which the author recognizes the problem and defines it.<sup>150</sup> At this stage, the author's cognition is open to receiving additional inputs from the environment.<sup>151</sup> The following stage is production, in which potential solutions to the problem are produced.<sup>152</sup> Then, another cycle of the cognition and production stages appears; new knowledge is gathered and additional potential solutions are created.<sup>153</sup> This cycle ends when a potential solution is compatible with the problem.<sup>154</sup> In between each of these stages, there is an intermediate stage of evaluation where the author checks the validity of the input, the potential solutions, and the problem structure.<sup>155</sup> The foundation of the entire process is the author's stored memory, which feeds

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Yingxu Wang & Vincent Chiew, *On the Cognitive Process of Human Problem Solving*, 11 COGNITIVE SYS. RES. 81, 85 (2010).

<sup>145</sup> See Kozbelt, Beghetto & Runco, *supra* note 34, at 33.

<sup>146</sup> See *id.*

<sup>147</sup> See GUILFORD, *supra* note 102, at 313–16.

<sup>148</sup> See *id.* at 315.

<sup>149</sup> See *id.*

<sup>150</sup> See *id.*

<sup>151</sup> See *id.*

<sup>152</sup> See *id.*

<sup>153</sup> See *id.*

<sup>154</sup> See *id.*

<sup>155</sup> See *id.*

every one of the different stages.<sup>156</sup> Importantly, when Guilford discussed stored memory, he referred to different types of information, such as visual-figural, symbolic, semantic, and behavioral.<sup>157</sup>

Philip Johnson-Laird, a psychologist professor and researcher focusing, among other things, on the creative process, proposed another model for creativity which fits the problem-solving and expertise category.<sup>158</sup> He theorized that five assumptions underlie the creative process: (1) the outcome of the process must be innovative for the author; (2) the outcome of the process may be innovative for society, but the author's mental process will be the same even if another author has already reached the same outcome; (3) presumably, the creative products are unknown in advance; (4) creativity adheres to preexisting constraints and conventions, whether external or internal to the author, and the author does not function as a closed system but is affected by existing aesthetic values; (5) works of authorship are not composed of "nothing;" rather, they are founded on preexisting grounds that function as raw material even for the most original works.<sup>159</sup>

The problem-solving and expertise approach to creativity is supported by a wealth of empirical and historical studies. Experimental research demystified some of the cognitive processes underlying creative innovation by showing that prior failed solution attempts leads to proper problem representation and heuristic learning that is crucial to creativity.<sup>160</sup> In addition, historical studies based on personal manuscripts of important artists have also shown that expertise plays an integral role in the creative process. American cognitive psychologist John R. Hayes, for example, studied five hundred works of seventy-six great composers and found that only three were composed before the tenth year of the composer's career.<sup>161</sup> As a result, some scholars have postulated that there is a

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<sup>156</sup> *See id.*

<sup>157</sup> *See id.*

<sup>158</sup> *See* Philip N. Johnson-Laird, *How Jazz Musicians Improvise*, 19 *MUSIC PERCEPTION* 415, 419-20 (2002).

<sup>159</sup> *See id.*

<sup>160</sup> *See* Kozbelt, Beghetto & Runco, *supra* note 34, at 33.

<sup>161</sup> *See* John R. Hayes, *Cognitive Processes in Creativity*, in *HANDBOOK OF CREATIVITY* 1989, *supra* note 31, at 139; *see also* Robert W. Weisberg, *Creativity and Knowledge: A Challenge to Theories*, in *HANDBOOK OF CREATIVITY* 1999, *supra* note 31, at 226, 230-31.

“10-year rule,” requiring at least ten years of experience to create masterpieces.<sup>162</sup> Other significant experiments have shown how artists and scientists explicitly utilize previous works to improve their creative skills.<sup>163</sup>

The creative problem-solving and expertise approaches best illustrate the importance of task-relevant knowledge to the creative process and the significance of prior knowledge and memory to innovation. These approaches—mainly Guilford’s—explain that the use of prior knowledge and memory applied to various types of information also include concrete and material types of knowledge and not only ideas, processes, or methods.<sup>164</sup> In this sense, it includes expression (in copyright terms) as an information type that is at the basis of creativity. Part III uses the historical research that verifies these theories to demonstrate the importance of knowledge and memory in creativity. In addition, the Part shows that these approaches fit the general division of the creative process into two sub-processes. However, it is important to note that the creative problem-solving approaches were criticized for two reasons: their inability to explain how authors identify problems at the beginning of the creative process; and their significant focus on expertise and prior knowledge as the only source of creativity.<sup>165</sup> This difficulty is especially relevant to creative activities in which the problem is ill-defined or does not exist because the activation of a heuristic mechanism in the problem-domain cannot account for the first stage of creativity.<sup>166</sup> The problem-finding approach to creativity completes this gap.

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<sup>162</sup> See Weisberg, *supra* note 161. The “10-year rule” suggested by Hayes was criticized because it does not account for different fields of creativity. See *id.* 231–232. Nevertheless, the idea behind this rule was validated by future studies that examined the length of preparation time artists need before achieving significant accomplishments in their fields. See *id.* at 232.

<sup>163</sup> For a list of studies, see Kozbelt, Beghetto & Runco, *supra* note 34, at 33. The different theories of creativity do not distinguish between authors and inventors, despite the distinction in copyright and patent laws.

<sup>164</sup> See GUILFORD, *supra* note 102, at 315.

<sup>165</sup> See Kozbelt, Beghetto & Runco, *supra* note 34, at 33–34.

<sup>166</sup> *Id.*

*D. Creativity as Problem Finding*

The problem-finding approach was proposed primarily as a reaction to the problem-solving approach to creativity and its shortcoming in explaining how authors identify problems and initiate the required motivation to engage in problem solving.<sup>167</sup> The problem-finding approach is attributed first and foremost to Jacob Getzels and Mihaly Csikszentmihalyi, two leading and groundbreaking creativity researchers who pointed out the importance of theorizing the problem-finding stage of creativity in 1976.<sup>168</sup> They argued that problem finding is a crucial first step to problem solving, and that is it not necessarily separated from the solution itself.<sup>169</sup> To test this hypothesis, they observed thirty-one art students performing an open task that required them to draw a set of objects provided by the researchers.<sup>170</sup> The study suggested that the openness of an author to a problem, and his investigative behavior while creating and adjusting the structure and content of the preliminary problem, indicate that the author is engaged in problem finding while searching for a solution for the first identified problem.<sup>171</sup>

However, Kozbelt, Beghetto, and Runco emphasized that the problem-finding approach, which was much more subjective, was not sufficiently validated through empirical research.<sup>172</sup> They argued that the research, which attempted to explain this approach, empirically could be better conceptualized under problem-solving models.<sup>173</sup> Thus, they argued that the distinction between both approaches is explained by scholars' differing emphasis and goals, rather than by the substantive differences in the two scholars' theories.<sup>174</sup> For example, if one is interested in the subjective motivation of authors, he would focus on the problem-finding approach; whereas, if one wishes to focus on the cognitive processes that

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<sup>167</sup> *See id.* at 34.

<sup>168</sup> *See* GETZELS & CSIKSZENTMIHALYI, *supra* note 144, at 89–106.

<sup>169</sup> *See id.* at 84.

<sup>170</sup> *See id.* at 85–86.

<sup>171</sup> *See id.* at 90.

<sup>172</sup> *See* Kozbelt, Beghetto & Runco, *supra* note 34, at 35.

<sup>173</sup> *See id.*

<sup>174</sup> *See id.*

cause the creation of new ideas, he would focus on the problem-solving approach.

The problem-finding approach is a complementary stage to the problem-solving approach in the sense that it accounts for the individual contribution of the author within the process of creation, when the problem-solving approach does not. If the two approaches are understood as two components of the same creative process, they are compatible with the description of the creative process as a two-phase process of unfocused and focused cognitive activity. In the legal context, the problem-finding approach emphasizes the independent contribution of the author to the creative product and conflicts with the post-modern approaches that diminished the author's role in the creative process.

### III. CRYSTALLIZATION OF THE UNFOCUSED THOUGHT — THE CRUCIAL ROLE OF KNOWLEDGE AND MEMORY

In spite of the differences between the various theories that seek to explain the cognitive process of creation, they all share general characteristics that have important implications for copyright law in general and, specifically, for the right to make derivative works. This Part argues that all the approaches include a division of the creative process into two main sub-processes. Thus, it is possible to characterize the creative process as follows: At the first stage, the author engages in unfocused thought where she has significant individual contribution to the process; and, at the second stage, the unfocused thought is crystallized into a concrete creative product in a way that is mainly dictated by prior task-relevant knowledge and memory stored in the author's brain. Each of these processes has implications for copyright law.

#### *A. Unfocused Thought—Associative Thought and Abstract Ideas*

The first characteristic all approaches to creativity have in common is that they refer to a phase of unfocused attention during which abstract ideas of the creative activity are formed. For example, in Wallas' stage theory, the incubation stage is characterized

by unfocused associative thought.<sup>175</sup> Similarly, the response generation stage in Amabile's model is characterized by abstract cognitive processes, which are driven by highly abstract creative-relevant skills.<sup>176</sup> Runco and Chand also refer to this creative phase in their idea presentation stage, which is described by unfocused creative thinking.<sup>177</sup>

Further, the unfocused thought phase is explicitly mentioned in some of the creative cognition approaches. Guilford, for example, referred to it as part of the divergent thinking process, which he described as unfocused and associative.<sup>178</sup> Similarly, Suler referred to the primary thought process as a metaphorical phase in which memories are not separated from one another.<sup>179</sup> Gabora's model offered a biological description of the unfocused phase of creativity when she described the formation of "neurds" during unfocused stimulation of neuron groups, which import relevant memory and knowledge into the focused thought stage.<sup>180</sup>

Finke, Ward, and Smith's Geneplore model more subtly distinguishes between the two phases. However, significant characteristics of the generation component of the model are compatible with the unfocused thought description. The generation component includes, for example, associative thought that is followed by new potential ideas.<sup>181</sup> In addition, some characteristics of the exploration component of the model are also compatible with unfocused thought, for instance, the metaphorical thought which the authors attribute to the exploration component.<sup>182</sup>

When considering the problem-solving and problem-finding approaches together, it is evident that they also refer to components that are compatible with the unfocused thought phase. For example, although Guilford's model appears highly structured and

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<sup>175</sup> See WALLAS, *supra* note 33, at 86.

<sup>176</sup> See AMABILE, CONTEXT, *supra* note 48, at 88–89, 95.

<sup>177</sup> See Runco & Chand, *supra* note 74, at 245–46.

<sup>178</sup> See GUILFORD, *supra* note 102, at 138.

<sup>179</sup> See Suler, *supra* note 106, at 144.

<sup>180</sup> See Gabora, *supra* note 111, at 5–6, 10.

<sup>181</sup> See FINKE, WARD & SMITH, *supra* note 121, at 20; Ward, Smith & Finke, *supra* note 123, at 191–92.

<sup>182</sup> See FINKE, WARD & SMITH, *supra* note 121, at 24; Ward, Smith & Finke, *supra* note 123, at 192.



based on analytical phases of knowledge use, it also recognizes the role of illumination and intuition in the creative process.<sup>183</sup> Johnson-Laird's assumption that the products of the creative process cannot be pre-known,<sup>184</sup> along with the notion that ill-defined problems could be split into several well-defined problems,<sup>185</sup> illustrates that the problem-solving approach identifies a stage that is not solely analytic and not necessarily based on knowledge and expertise. Thus, these approaches also fit the unfocused thought phase of creativity and the problem-finding approach.

The discussion thus far shows that the predominant approaches to the cognitive process of creativity systematically identify stages and components in which unfocused thought occurs and produces preliminary abstract ideas at the early stages of the creative process. However, for the purpose of this Article, the more relevant stage of creativity is the phase in which the abstract ideas are crystallized into a socially valuable concrete product. The next Section discusses how each of these theories identifies stages of crystallization of ideas using task-relevant knowledge and memory.

#### *B. The Use of Task-Relevant Knowledge*

The second characteristic that all approaches to creativity share is reliance on preexisting task-relevant knowledge and memory in different stages of the creative process. One example is found in Wallas' stage theory. The use of task-relevant knowledge is evident in two main stages: the preparation and validation stages. In the preparation stage, as described by Wallas, the author uses prior expertise and task-relevant knowledge to prepare for the creative process.<sup>186</sup> At the validation stage, the author consciously examines the preliminary ideas in light of his task-relevant expertise. Knowledge plays a crucial role at this point as well. In fact, Wallas himself described the preparation and validation stages as strongly interrelated.<sup>187</sup>

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<sup>183</sup> See GUILFORD, *supra* note 102, at 321–24.

<sup>184</sup> See Johnson-Laird, *supra* note 158, at 419.

<sup>185</sup> See Kozbelt, Beghetto & Runco, *supra* note 34, at 33.

<sup>186</sup> See WALLAS, *supra* note 33, at 88–84; *see also* Collins, *supra* note 144, at 209 (finding that composers consciously choose between known genres at the preparation stage according to qualitative empirical research).

<sup>187</sup> See WALLAS, *supra* note 33, at 85–86.

Amabile's further developed stage model explicitly acknowledged the use of task-relevant knowledge. The model defined task-relevant skills as one of the three components of the creative process.<sup>188</sup> Like the analysis suggested above with regard to Wallas' theory, Amabile attributed the use of task-relevant knowledge to the preparation and response validation stages.<sup>189</sup> It thus seems that Amabile dedicated a significant and explicit attention to the use of task-relevant knowledge in the creative process.<sup>190</sup> Runco and Chand also explicitly acknowledged the significance of task-relevant knowledge (which they referred to as declarative knowledge) as a main component that affects the problem presentation and ideation stages.<sup>191</sup>

The use of task-relevant knowledge is also emphasized in the creative cognition approaches. Guilford's convergent thinking included analytical skills and the use of knowledge and memory as he stated explicitly.<sup>192</sup> The secondary thought process described by Suler also fits the use of prior task-relevant knowledge because its purpose is to consciously control and form abstract ideas into concrete products.<sup>193</sup> The same applies for Gabora's honing model of creativity, in which the author's memory holds the most significant part.<sup>194</sup> Although Gabora identified the use of memory at the phase of unfocused thought, she explicitly noted that it is used in the focused thought phase when memory cells are activated along with the sporadic ideas created by activation of "neurds."<sup>195</sup> The generation process in Finke, Ward, and Smith's Geneplore model also consisted of task-relevant knowledge use.<sup>196</sup> The researchers defined this process as including the restoration of knowledge and

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<sup>188</sup> See AMABILE, CONTEXT, *supra* note 48, at 85-86.

<sup>189</sup> See *id.* at 95-96.

<sup>190</sup> See *id.*

<sup>191</sup> See Runco & Chand, *supra* note 74, at 245-46.

<sup>192</sup> See GUILFORD, *supra* note 102, at 313-15, 319.

<sup>193</sup> See Suler, *supra* note 106, at 145-46.

<sup>194</sup> See Gabora, *supra* note 111, at 10.

<sup>195</sup> See *id.*

<sup>196</sup> See FINKE, WARD & SMITH, *supra* note 121, at 19.

memory structures and adapting them for compatibility with the relevant task.<sup>197</sup>

The problem-solving approach to creativity best illustrates the significance and centrality of task-relevant knowledge and memory to the process of creation. The essence of this approach is the understanding of the creative process as a logical-analytical system to problem solving that is based on task-relevant expertise and previous knowledge.<sup>198</sup> The use of prior knowledge is evident in Guilford's model, in which memory storage is used during every cognitive activity throughout the creative process.<sup>199</sup> He expressly referred to the importance of knowledge in the creative process and explained that it was characterized by restoring, reproducing, and adapting memory structures into a new product.<sup>200</sup> Guilford also articulated the different types of information that are used, including semantic, visual, and symbolic knowledge.<sup>201</sup> Johnson-Laird's approach also focused on task-relevant knowledge and the crucial role of memory in the process of creation. Indeed, two of his five assumptions about creativity concern these components: He pointed out that the creative process must fit predefined creative constraints and be based upon preexisting elements.<sup>202</sup> In addition, Robert Weisberg, an American cognitive psychologist who focused on creativity studies and the study of geniality, demonstrated the importance of task-relevant knowledge and expertise in a series of experiments.<sup>203</sup>

Thus, the cognitive process of creation is divided into two main sub-processes: (1) unfocused thought, during which abstract ideas form as a result of the author's associative thought; and (2) the use of task-relevant knowledge and memory during focused thought for

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<sup>197</sup> See *id.*, at 20; Ward, Smith & Finke, *supra* note 123, at 191-92; see also Thomas B. Ward & Yuliya Kolomyts, *Cognition and Creativity*, in THE CAMBRIDGE HANDBOOK OF CREATIVITY, *supra* note 34, at 93, 93.

<sup>198</sup> See GUILFORD, *supra* note 102, at 317.

<sup>199</sup> See *id.* at 315.

<sup>200</sup> See *id.* at 319.

<sup>201</sup> See *id.*

<sup>202</sup> See Johnson-Laird, *supra* note 158, at 419-20.

<sup>203</sup> See ROBERT W. WEISBERG, CREATIVITY: BEYOND THE MYTH OF GENIUS 113-22 (1993) [hereinafter WEISBERG, GENIUS]; Robert W. Weisberg, *Problem Solving and Creativity*, in THE NATURE OF CREATIVITY: CONTEMPORARY PSYCHOLOGICAL PERSPECTIVES 148, 148-60 (Robert J. Sternberg ed., 1988).

the purpose of crystallizing preliminary abstract ideas into a concrete perceivable form. As noted above, the two sub-processes are relevant to copyright law.<sup>204</sup> The first sub-process is relevant to the discussion on the independent and original contribution of the author to a creative product—copyright law’s originality requirement—especially in light of post-modern discourse on the romantic author approach. The second sub-process is most relevant to the idea/expression dichotomy and the derivative work right because the use of prior knowledge is an inherent part of the creative process and incorporates what copyright law refers to as a derivative work. Further, the second sub-process reveals a mismatch between the law and the cognitive psychology of creativity. The next Part will focus on how cognitive psychologists describe the use of prior task-relevant knowledge and the notions that arise from these descriptions, which, as discussed below, have important implications for copyright law and the derivative work right.

#### IV. THE USE OF TASK-RELEVANT KNOWLEDGE AND MEMORY IN THE CREATIVE PROCESS

The use of task-relevant knowledge and memory are a crucial and inseparable part of creativity under cognitive psychology’s predominant approaches to creativity. Now, it is important to discuss the way task-relevant knowledge and memory are formed and used. To this end, this Part discusses theoretical notions about the use of prior knowledge that are based on empirical and historical studies of the cognitive process of creativity. The Part argues that the use of task-relevant knowledge and memory is not restricted to creative activities (such as ideas, processes, and methods) that are not afforded protection under copyright law and are therefore free to be used for further creative activities. Rather, task-relevant knowledge and memory also include concrete expressions that are stored in the author’s memory as part of his visual, semantic, and symbolic knowledge. Consequently, the use of expression as a basis for creative activity is not qualitatively different from the use of mere ideas under the cognitive understanding of the creative process. Both elements are an inherent part of the creative

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<sup>204</sup> See *supra* notes 130–42 and accompanying text.

process.<sup>205</sup> This observation has significant implications for copyright law, especially the derivative work right.

As emphasized in the introduction, the tension between the use of task-relevant knowledge and memory in the creative process and the derivative work right does not necessarily lead to the conclusion that authors should be deprived of an exclusive right to their derivative works. Nevertheless, copyright law's distinction between ideas and expressions is not justified by the theoretical underpinnings of creativity because there is a mismatch between the legal norm and the cognitive understanding of creativity. Accordingly, the legal profession should question whether the law should bridge this gap and fully mirror the cognitive understanding of creativity. It is also important to note that it may be that the creative process is affected by external factors such as culture, economy, religion, and the law. This Article does not argue that the cognitive process of creation is a closed and fixed system; it argues that to the extent the law affects creativity, as may happen due the existing mismatch presented here, it is important to ask whether this effect is desired and justified.

#### *A. Theoretical Analysis of the Use of Knowledge and Memory*

In their work, Runco and Chand dedicated a vast discussion to the role of knowledge and memory in creativity.<sup>206</sup> As for knowledge, they suggested a distinction between procedural and declarative knowledge.<sup>207</sup> Procedural knowledge refers to familiarity with strategies by which certain task-related processes could be accomplished (i.e., know-how).<sup>208</sup> When an author chooses a useful strategy, procedural knowledge has a significant contribution to creativity.<sup>209</sup> In a series of studies, Runco, Chand, and their collaborators tested the effect of procedural knowledge on creativity.<sup>210</sup> The researchers divided participants into two groups and gave each group

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<sup>205</sup> It is important to note that copyright law permits the use of another's expressions in certain circumstances, such as under the fair use doctrine. *See* 17 U.S.C. § 107 (2012).

<sup>206</sup> *See* Runco & Chand, *supra* note 74, at 245–46, 249.

<sup>207</sup> *See id.* at 246.

<sup>208</sup> *See id.*

<sup>209</sup> *See id.*

<sup>210</sup> *See id.* at 246–47.

the same task.<sup>211</sup> One group received general guidelines about how to accomplish the task, while the other group received explicit directions for achieving the task.<sup>212</sup> The studies revealed not only that explicit directions lead to greater innovation, but also that procedural knowledge may overcome thought fixation at the ideation stage of creativity.<sup>213</sup>

Declarative knowledge, on the other hand, refers to factual information stored in the author's memory.<sup>214</sup> Runco and Chand theorized that declarative knowledge contributes to the creative process by supplying the necessary information for the creation of ideas.<sup>215</sup> Support for this theory is found in historical studies that show the need to acquire expertise in a field before achieving substantial creative accomplishments.<sup>216</sup> Runco and Chand argued that declarative knowledge directly affects the ideation stage because an author with greater task-relevant expertise has a wider set of tools to develop preliminary ideas.<sup>217</sup> For example, they argued that when a person is asked to engage in an open task that includes round objects, he will have an advantage if his expertise includes knowledge of round things, such as an astronomer who knows the general features of planets or a biologist who understands molecules or cells.<sup>218</sup> They also emphasized that declarative knowledge is mainly experience-based but could be achieved by relevant environmental cues.<sup>219</sup>

Additionally, Runco and Chand explained that both procedural and declarative knowledge are stored in long-term memory, which

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<sup>211</sup> *See id.*

<sup>212</sup> *See id.*

<sup>213</sup> *See id.* at 247. For the full studies, see Ivonne Chand & Mark A. Runco, *Problem Finding Skills as Components in the Creative Process*, 14 *PERSONALITY & INDIVIDUAL DIFFERENCES* 155 (1993); Mark A. Runco, *Maximal Performance on Divergent Thinking Tests by Gifted, Talented, and Nongifted Children*, 23 *PSYCHOL. SCH.* 308 (1986); M.A. Runco & S.M. Okuda, *The Instructional Enhancement of the Flexibility and Originality Scores of Divergent Thinking Tests*, 5 *APPLIED COGNITIVE PSYCHOL.* 435 (1991).

<sup>214</sup> *See* Runco & Chand, *supra* note 74, at 246.

<sup>215</sup> *See id.* at 248.

<sup>216</sup> *See, e.g.,* Hayes, *supra* note 161. For a discussion of additional similar studies, see *infra* Section IV.C.

<sup>217</sup> Runco & Chand, *supra* note 74, at 248.

<sup>218</sup> *See id.*

<sup>219</sup> *See id.*

can be accessed at any moment in order to engage with a task.<sup>220</sup> However, they noted that merely accessing procedural and declarative knowledge would likely lead to an unoriginal and uncreative product.<sup>221</sup> They posited that the memory in which knowledge is stored could be divided into two types: episodic, defined as a detailed memory of an experience, and semantic, defined as a memory that contains only general characteristics of the relevant experience.<sup>222</sup> Semantic memory is especially relevant to the creative process because it contains “gaps” and therefore does not allow a full reproduction of a relevant experience.<sup>223</sup> Thus, semantic memory allows an author to restore parts of a specific experience and reconstruct other parts to engage in a relevant task.<sup>224</sup> Runco and Chand argued that such reconstruction of memory is a creative activity.<sup>225</sup> It is important to clarify once again that declarative knowledge consists of concrete instances, and, in this sense, includes both ideas and expressions in copyright terms. The result of the reflection on explicit artistic expressions, as part of an experience that is stored in the author’s memory, while restoring it and reconstructing it may be an example of a derivative work in the legal sense.

In fact, Runco and Chand explained that creative thinking is memory-based.<sup>226</sup> They relied on scholars Pat Langley and Randolph Jones, who argued that knowledge assists creativity by allowing its restoration through thought indexes created for each creative domain.<sup>227</sup> Langley and Jones explained:

Humans possess no general creativity factor; so no such component exists to be measured. Instead,

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<sup>220</sup> *See id.*

<sup>221</sup> *See id.* The use of the term originality in this context does not refer to the meaning of this term in the legal context. However, it seems that the intent of the authors was very similar because they emphasized that mere restoration of information without additional creativity or adaptation is not a creative or original activity. *See id.*

<sup>222</sup> *See id.* at 249.

<sup>223</sup> *See id.*

<sup>224</sup> *See id.*

<sup>225</sup> *See id.*; see also Wang, *Cognitive Foundations*, *supra* note 144, at 2 (“The nature of creation is a new and unusual relationship between two or more objects that generates a novel and meaningful concept, solution, method, explanation, or product.”).

<sup>226</sup> *See* Runco & Chand, *supra* note 74, at 249.

<sup>227</sup> *See id.*

humans possess a wealth of knowledge structures indexed by concepts that a person judges as important. The level of creativity that one exhibits will depend on one's knowledge, one's indexing scheme, and the particular situation in which one finds oneself.<sup>228</sup>

Runco and Chand's account of the use of prior knowledge and memory in the creative process is also backed by additional theoretic literature. Roger Schank, an American cognitive psychologist who focuses on artificial intelligence and creativity, described in his knowledge structure model that when an author encounters a cognitive input, he processes it in light of his existing knowledge structures and that input is embedded into memory in a way that allows future access.<sup>229</sup> Dynamic memory, according to Schank, refines this process when inputs are received in the author's memory that relate to existing knowledge structures or past experiences.<sup>230</sup> Thus, an author's prior experiences alter the author's knowledge structure.<sup>231</sup> Accordingly, the author's ability to understand new phenomena and problems in the world is based on a dynamic memory loaded with knowledge of prior experiences. When an author is required to engage with a task, he uses prior knowledge structures and experiences to detect what Schank refers to as an "explanation pattern" that the author used in the past.<sup>232</sup> Schank also argued that the creative process is characterized by two sub-processes.<sup>233</sup> The first is the search for a possible explanation pattern, and the second is an adaptation process in which the explanation pattern is restored from memory and adapted so that it is compatible with the relevant task.<sup>234</sup> The emphasis on the adaptation and restructuring as a basis for creativity is evident here as well.<sup>235</sup> This theoretical

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<sup>228</sup> See *id.* (citing Pat Langley & Randolph Jones, *A Computational Model of Scientific Insight*, in *THE NATURE OF CREATIVITY*, *supra* note 203, at 177, 199).

<sup>229</sup> See Roger C. Schank, *Creativity as a Mechanical Process*, in *THE NATURE OF CREATIVITY*, *supra* note 203, at 220, 221.

<sup>230</sup> See *id.*

<sup>231</sup> See *id.*

<sup>232</sup> See *id.*

<sup>233</sup> See *id.*

<sup>234</sup> See *id.*

<sup>235</sup> See *id.*



approach could apply to both the adaptation and restructuring of expressions and ideas that are part of an author's knowledge base. Both types of knowledge could be part of the cognitive process of creativity.

American psychologist Robert J. Sternberg also empathized the role of knowledge and memory in creativity in his three-facet model to creativity.<sup>236</sup> He referred to the components of knowledge acquisition in the process of creation and their effect on creative illumination.<sup>237</sup> Of the three potential causes for illumination presented, two refer to processes similar to those discussed thus far. One cause, according to Sternberg, is "selective combination," in which illumination is created due to a synthesis between separate pieces of stored information.<sup>238</sup> The ability to perform such a process depends on the author's prior knowledge—the wider the knowledge pool, the greater variety of combinations.

Additionally, Sternberg referred to "selective comparison," which compares new information to preexisting knowledge and its characteristics to understand and use the new information.<sup>239</sup> He argued that problem solving by analogy is one example of this cause of illumination.<sup>240</sup> Paul J. Locher, a professor of experimental psychology, reached similar conclusions.<sup>241</sup> He reviewed empirical and historical studies on the process of creation, such as brain imaging, X-ray studies of artworks, and archival studies on the creation of historical masterpieces in real time.<sup>242</sup> Based on these studies, Locher argued that the use of procedural and declarative knowledge is essential and central to all stages of the creative process.<sup>243</sup> Sternberg's emphasis on the importance of synthesis between existing knowledge components in the process of creation, along with Locher's focus on the importance of declarative knowledge (which

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<sup>236</sup> See Robert J. Sternberg, *A Three-Facet Model of Creativity*, in THE NATURE OF CREATIVITY, *supra* note 203, at 125, 137.

<sup>237</sup> See *id.* at 135.

<sup>238</sup> See *id.* at 136.

<sup>239</sup> See *id.*

<sup>240</sup> See *id.*

<sup>241</sup> See Paul J. Locher, *How Does a Visual Artist Create an Artwork*, in THE CAMBRIDGE HANDBOOK OF CREATIVITY, *supra* note 34, at 131, 131.

<sup>242</sup> See *id.*

<sup>243</sup> See *id.* at 143.

includes both ideas and expression) to the creative process support the argument that no qualitative distinction between ideas and expressions exists.

### *B. Empirical Studies on Creativity*

American creativity researchers Wayne Baughman and Michael Mumford assumed in their studies that merely restoring an application of prior experiences and knowledge by the author is not likely to lead to creativity.<sup>244</sup> However, they argued that combining and restructuring existing knowledge is a good mechanism for ideation.<sup>245</sup> This argument was based on several studies showing that creative development in many fields requires the combination and restructuring of existing knowledge.<sup>246</sup> They referred to the research of Michele Mobley (and his co-authors), who argued that it is impossible to create something from nothing and that a generation of new ideas has to be based on existing knowledge structures.<sup>247</sup> Mobley hypothesized that if authors are asked to combine diverse categories, their creative products will be more original.<sup>248</sup> To test this theory, 160 participants were asked to work with exemplars of various categories, to combine them in order to create new categories, and to suggest new exemplars for the new categories and write a story that describes them.<sup>249</sup> They found more originality when participants combined more distant categories, but the results also demonstrated that the quality of the products declined when participants worked with distant categories, which was likely due to difficulties that arose when working with unknown categories.<sup>250</sup>

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<sup>244</sup> See Wayne A. Baughman & Michael D. Mumford, *Process-Analytic Models of Creative Capacities: Operations Influencing the Combination-and-Reorganization Process*, 8 *CREATIVITY RES. J.* 37, 38 (1995).

<sup>245</sup> See *id.*

<sup>246</sup> See *id.*

<sup>247</sup> See *id.* at 39 (citing Michele I. Mobley et al., *Process Analytic Models of Creative Capacities: Evidence for the Combination and Reorganization Process*, 5 *CREATIVITY RES. J.* 125 (1992)).

<sup>248</sup> See *id.* (citing Mobley et al., *supra* note 247).

<sup>249</sup> See *id.* at 39–40 (citing Mobley et al., *supra* note 247).

<sup>250</sup> See *id.* at 40 (citing Mobley et al., *supra* note 247).

Following Mobley, Baughman and Mumford conducted the following study: 155 participants were given exemplars of undefined categories.<sup>251</sup> They were first asked to identify each category according to the exemplars provided.<sup>252</sup> They were then asked to create a category that united all the categories mapped by them and to find an exemplar for the united category.<sup>253</sup> Finally, the participants were asked to define the new category and to find more exemplars for it.<sup>254</sup> Analyzing the findings, Baughman and Mumford concluded that, under some conditions, tasks involving the combination of categories lead to better and more original creative products.<sup>255</sup> In addition, they noted that the process of combination and reorganization is executed by searching for the characteristics of each category and mapping them, and that only a combination of the two would lead to greater originality.<sup>256</sup>

Finke, Ward, and Smith conducted a line of similar studies focusing on a combination and reorganization of the categories and the importance of exemplars.<sup>257</sup> They focused on the effects that categories and known perceptions have on the creative process.<sup>258</sup> This was based on the perception that new ideas, as creative as they may be, are usually developed as limited expansions of existing perceptions.<sup>259</sup> Their first study, conducted in 1994, consisted of five experiments.<sup>260</sup> In the first experiment, thirty-seven participants were asked to draw an animal they may encounter on a different planet, another animal from the same species, and an animal from the same planet but from a different species.<sup>261</sup> The results showed that the vast majority of animals drawn had earthy features (bilateral symmetry, sensory organs, limbs, etc.), which shows that

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<sup>251</sup> See *id.* at 42.

<sup>252</sup> See *id.* at 43.

<sup>253</sup> See *id.*

<sup>254</sup> See *id.*

<sup>255</sup> See *id.* at 54.

<sup>256</sup> See *id.* at 54–55.

<sup>257</sup> See Ward, Smith & Finke, *supra* note 123, at 191–92, 195.

<sup>258</sup> See *id.* at 195.

<sup>259</sup> See *id.*

<sup>260</sup> See Thomas B. Ward, *Structured Imagination: The Role of Category Structure in Exemplar Generation*, 27 COGNITIVE PSYCHOL. 1, 7 (1994).

<sup>261</sup> See *id.*

when an author is asked to create an exemplar for a known category, his work will be highly structured.<sup>262</sup>

In their second experiment, 180 participants were asked to draw an animal residing on a different planet that is completely different than earth.<sup>263</sup> The participants were divided into four groups; one group did not receive any guidance, and the other group was instructed that the animal had either feathers, fur, or lives underwater.<sup>264</sup> This experiment also indicated that there is significant use of prior knowledge of the characteristics of a category in the process of finding a new exemplar for the category.<sup>265</sup> That is why participants in the feathers group tended to draw winged animals, and participants in the underwater group tended to draw animals with fins.<sup>266</sup> Similarly, participants in the fur and feather groups tended to draw animals with two feet and participants in the feathers group tended to draw animals with a beak.<sup>267</sup> Three additional experiments also produced results showing that participants usually restore known exemplars of earthy animals when asked to draw imaginary animals.<sup>268</sup>

Based on these findings, Finke, Ward, and Smith proposed the term “structured imagination” to describe an author’s tendency to create new ideas while preserving existing categories and noted: “Imagination is structured or directed by knowledge of the category or categories most related to the individual’s goals.”<sup>269</sup> Later, Finke, Ward, and Smith explained that the use of knowledge in this context refers to both long-term memory and to knowledge gathered during engagement with the relevant task.<sup>270</sup> To describe the process in which the author uses preexisting knowledge structures, Finke, Ward, and Smith proposed the “path of least resistance”

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<sup>262</sup> *See id.* at 8–11.

<sup>263</sup> *See id.* at 12.

<sup>264</sup> *See id.*

<sup>265</sup> *See id.* at 13–18.

<sup>266</sup> *See id.* at 13.

<sup>267</sup> *See id.* at 13–14.

<sup>268</sup> *See id.* at 22–23, 26–28, 30.

<sup>269</sup> *Id.* at 31.

<sup>270</sup> *See* Ward, Smith & Finke, *supra* note 123, at 198.

model.<sup>271</sup> They postulated that when an author imagines a new entity, she first determines the task-relevant knowledge-domain, and then accesses the existing knowledge in that domain to construct a new entity.<sup>272</sup>

Thomas Ward, a cognition and creativity researcher, and Yuliya Kolomyts, a language researcher, both of the University of Alabama, expanded this model and noted that when authors develop new ideas in a specific domain, their first inclination is to access specific exemplars from this domain as a starting point, retrieve characteristics from these exemplars, and then import them into developing ideas.<sup>273</sup> This is based on empirical findings of Ward and his followers, which suggested that to develop an exemplar for a new domain, authors develop products that are substantially similar to exemplars of existing domains.<sup>274</sup> It is likely that this tendency is an inherent part of structured imagination.<sup>275</sup> Notably, Ward theorized that the probability of innovative creativity is higher when the author uses larger systems of knowledge instead of mere exemplars.<sup>276</sup> However, Ward and Kolomyts emphasized that, while using more abstract ideas would probably lead to more creativity, it would come at the expense of compatibility and usability of the creative products and thus diminish their value.<sup>277</sup> Therefore, it should be expected that the “constraining” effect that reliance on prior knowledge and exemplars has on innovation is necessary to reach meaningful and valuable creative products.<sup>278</sup>

The studies discussed in this Article thus far focus on creative thought, generally, and all fields of creative activity—not only those to which copyright law applies.<sup>279</sup> There are very few empiri-

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<sup>271</sup> See *id.*; see also Ward, *supra* note 260, at 35; Thomas B. Ward, *What’s Old About New Ideas?*, in *THE CREATIVE COGNITION APPROACH* 157, 174 (Steven M. Smith, Thomas B. Ward, & Ronald A. Finke eds., 1995).

<sup>272</sup> See sources cited *supra* note 271.

<sup>273</sup> See Ward & Kolomyts, *supra* note 197, at 100.

<sup>274</sup> See *id.* at 99.

<sup>275</sup> See *id.*

<sup>276</sup> See Ward, *supra* note 260, at 36.

<sup>277</sup> See Ward & Kolomyts, *supra* note 197, at 100.

<sup>278</sup> See *id.* at 101.

<sup>279</sup> It is important to note that the theoretical literature on cognitive psychology does not distinguish between works of authorship, inventions, and abstract creative thought.

cal studies that focus directly on artworks and other works of authorship. Nevertheless, there are numerous studies relevant to this Article's discussion that examine the process of *making* works of art. Japanese cognitive psychologists Sawako Yokochi and Takeshi Okada attempted to empirically test different theoretical approaches to creativity by studying the process of creating artworks.<sup>280</sup> For this purpose, they observed Chinese Suibokuga, a traditional painter in his sixties with twenty years of experience, for a three-year period.<sup>281</sup> The painter was asked to draw eight paintings on an empty canvas and eight additional paintings on a canvas containing fifteen random lines drawn by two other participants.<sup>282</sup> Yokochi and Okada identified two important characteristics in these studies: First, when the painter worked with the empty canvas, he used the same painting strategy every time.<sup>283</sup> Second, when the painter worked with predetermined random lines, his paintings were less accurate in their composition but much more original in their style.<sup>284</sup> This observation was corroborated by interviews with the painter after the study.<sup>285</sup> The researchers concluded, based on this findings, that the approach of Finke, Ward, and Smith was accurate and that combining preexisting knowledge structures containing components from past experiences contributes significantly to innovation.<sup>286</sup>

Another qualitative study conducted by cognitive psychologists Mary-Anne Mace and Tony Ward attempted to develop a model for the creative process behind artworks.<sup>287</sup> They conducted semi-

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This does not diminish the applicability of these theories to creative activities governed by copyright law.

<sup>280</sup> See Sawako Yokochi & Takeshi Okada, *Creative Cognitive Process of Art Making: A Field Study of a Traditional Chinese Ink Painter*, 17 *CREATIVITY RES. J.* 241, 241 (2005).

<sup>281</sup> See *id.* at 243.

<sup>282</sup> See *id.*

<sup>283</sup> See *id.* at 244–45. The researchers noted that in fifteen out of the sixteen paintings the painter started drawing a tree and only later added other objects. *Id.*

<sup>284</sup> See *id.* at 247.

<sup>285</sup> See *id.*

<sup>286</sup> See *id.* at 250; see also Ward, Smith & Finke, *supra* note 123, at 192.

<sup>287</sup> See Mary-Anne Mace & Tony Ward, *Modeling the Creative Process: A Grounded Theory Analysis of Creativity in the Domain of Art Making*, 14 *CREATIVITY RES. J.* 179, 180 (2002).

structured interviews with authors during the creative process.<sup>288</sup> At the first stage, sixteen visual artists were interviewed at three different times during their creative process—first, at the beginning of the process, second, in the middle of the it, and third at the end of the process.<sup>289</sup> The participants were asked to describe their creative process at the relevant stage of the interview and to refrain from reporting general theories about the creative process.<sup>290</sup> After analyzing the findings, the researchers proposed a detailed model for the creation of artworks based on the interviews.<sup>291</sup> According to Mace and Ward, the creation of a work of art does not develop out of a conceptual void; rather, it is a product of thought and ongoing experience.<sup>292</sup> They argued that the author obtains a vast knowledge base of the creative process over time, explicitly and implicitly understanding techniques, skills, genres, theories, aesthetics, *prior works*, and art in its contemporary and historical sense.<sup>293</sup> This knowledge develops along with the process of creation, and the author refers to it at every stage of the process.<sup>294</sup> They later verified the results of this study.<sup>295</sup> It is important to note that Mace and Ward explicitly emphasized that the creative process is also based on explicit knowledge of prior works that the author refers to during the process.<sup>296</sup> They also stressed that this aspect links the process of creating a current work with previous and future works in the same domain.<sup>297</sup> In this sense, it is clear that the process of creation includes the use of expressions as well as ideas.<sup>298</sup>

In the past three decades, the number of quantitative empirical studies of creativity using methodologies and instruments from neurosciences has grown tremendously. The two main methodologies in this field are the use of functional magnetic resonance imag-

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<sup>288</sup> *See id.* at 181.

<sup>289</sup> *See id.*

<sup>290</sup> *See id.*

<sup>291</sup> *See id.* at 182–88.

<sup>292</sup> *See id.* at 182.

<sup>293</sup> *See id.* at 188.

<sup>294</sup> *See id.*

<sup>295</sup> *See id.*

<sup>296</sup> *See id.* at 189.

<sup>297</sup> *See id.* at 182.

<sup>298</sup> *See id.*

ing (“fMRI”) and an electroencephalogram (“EEG”).<sup>299</sup> One example of such a study was American cognitive psychologist Robert L. Solso, who examined the creative process in real-time using fMRI.<sup>300</sup> Solso measured the brain activity of British portrait artist Humphrey Ocean while he drew portraits of figures that were presented to him, and compared it to the brain activity of another amateur participant performing the same task.<sup>301</sup> The two participants were asked to draw the faces of presented figures for thirty seconds while undergoing fMRI.<sup>302</sup>

The results of the study showed excessive activity in the right-rear part of the amateur participant’s brain when compared to Ocean’s.<sup>303</sup> According to Solso, this showed that Ocean’s experience and expertise in face-detection and understanding may have led to less effort in the parts of the brain charged with face-detection.<sup>304</sup> The more interesting result, however, was that Ocean’s brain showed excessive activity in the front-central part of the right lobe, which is in charge of associative thinking and manipulation of visual structures.<sup>305</sup> According to Solso, this indicated that, while the amateur participant reproduced the figures presented to him, Ocean thought about them and associatively adapted them.<sup>306</sup>

In a different fMRI study conducted by cognition and brain scientist Melissa Ellamil (and her co-authors), fifteen visual art students were presented with short book descriptions and asked to

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<sup>299</sup> See Keith Sawyer, *The Cognitive Neuroscience of Creativity: A Critical Review*, 23 *CREATIVITY RES. J.* 137, 138–40 (2011). An fMRI uses magnetic traits of oxygenated blood cells in comparison with un-oxygenated cells to examine which parts of the brain are active at a specific time. The technique produces an image portraying the difference between the oxygenation levels of different blood cells and shows a model-based image of the active parts of the brain during the sample. An EEG measures electromagnetic pulses created by the activity of neurons in the brain cortex by placing electrodes on the scalp of the participant. *Id.*

<sup>300</sup> See Robert L. Solso, *Brain Activities in a Skilled Versus a Novice Artist: An fMRI Study*, 34 *LEONARDO* 31, 33 (2001).

<sup>301</sup> *See id.*

<sup>302</sup> *See id.*

<sup>303</sup> *See id.*

<sup>304</sup> *See id.*

<sup>305</sup> *See id.* at 33–34.

<sup>306</sup> *See id.* at 34.



draw illustrations for each book's cover on a tablet computer connected to fMRI.<sup>307</sup> Later, they were asked to review their illustrations and evaluate them.<sup>308</sup> The researchers noted that at the production stage of the illustrations, excessive brain action occurred in the medial temporal lobe, which is in charge of the processing of semantic memory and recombination of memory using associations.<sup>309</sup> The researchers explained that this finding fits theoretical approaches that focus on associative processing and recombination of existing knowledge as the basis for creativity.<sup>310</sup>

Studies using the EEG methodology have also validated some of the theoretical approaches to creativity concerning the use of task-relevant knowledge and memory.<sup>311</sup> Austrian cognitive psychologists Andreas Fink and Mathias Benedek reviewed many EEG studies that focused on creativity.<sup>312</sup> Among other findings, they concluded that all studies showed changes in alpha power in the author's brain cortex during creative activity.<sup>313</sup> One of the consistent changes that Fink and Benedek identified was an increase in alpha power in the rear part of the parietal lobe of the brain cortex.<sup>314</sup> They surmised that because this part of the brain is in charge of memory, the increase in alpha power should be unders-

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<sup>307</sup> See Melissa Ellamil et al., *Evaluative and Generative Modes of Thought During the Creative Process*, 59 *NEUROIMAGE* 1783, 1784–85 (2012).

<sup>308</sup> See *id.* at 1785.

<sup>309</sup> See *id.* at 1786, 1791.

<sup>310</sup> See *id.* at 1791. For additional studies finding a correlation between creativity and brain activity in the medial temporal lobe, see Huimin Zheng, Jiayi Luo & Rongjun Yu, *From Memory to Prospection: What Are the Overlapping and the Distinct Components Between Remembering and Imagining?*, 5 *FRONTIERS PSYCHOL.* 1, 10 (2014).

<sup>311</sup> See, e.g., Andreas Fink & Mathias Benedek, *EEG Alpha Power and Creative Ideation*, 44 *NEUROSCIENCE & BIOBEHAVIORAL REV.* 111, 111 (2014).

<sup>312</sup> See *id.* at 113.

<sup>313</sup> See *id.* As explained above, an EEG measures electromagnetic pulses created by the activity of neurons in the brain cortex. See *supra* note 299 and accompanying text. These pulses are measured in several frequencies. The frequency between 8 and 12 Hz is referred to as “alpha power.” The changes in alpha power are measured before and after a stimulating event occurs. A decrease in alpha power is referred to as event-related desynchronization, while an increase in alpha power is referred to as event-related synchronization. See Fink & Benedek, *supra* note 311, at 114–15.

<sup>314</sup> See Fink & Benedek, *supra* note 311, at 117.

tood as an attempt to search and restore memory in order to use and recombine knowledge for the creative process.<sup>315</sup>

Despite the differences in the various neuroscientific studies of creativity, many researchers reached similar conclusions about the use of task-relevant knowledge and memory in the creative process. American creativity researcher Keith Sawyer, for example, reviewed the studies published in this field between October 2010 and May 2011.<sup>316</sup> Although he urged psychologists to think critically about the use of neuroscience in creativity studies and to understand the shortcomings, he nevertheless concluded that there are a number of areas where the results are undisputed.<sup>317</sup> For instance, he emphasized that associative thinking—the recombination of preexisting knowledge and task-relevant expertise—is an undisputed part of creativity.<sup>318</sup> In a different literature review, cognitive psychologists Sureyya Yoruk and Mark Runco examined fMRI and EEG studies conducted from 2004 to 2014.<sup>319</sup> They concluded that creativity is characterized by excessive brain activity in the left part of the brain, specifically in the lower parietal lobe, which is in charge of storing semantic memory.<sup>320</sup> In addition, they argued that these areas of the brain are in charge of creating preliminary associations that function as a step toward more distant associations that develop in the right hemisphere of the brain where EEG studies show excessive alpha power.<sup>321</sup> Therefore, they concluded that creativity is characterized by the processing and recombination of semantic memory and task-relevant knowledge contained within such processing.<sup>322</sup>

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<sup>315</sup> See *id.* at 119. For similar findings, see Mathias Benedek et al., *Alpha Power Increases in Right Parietal Cortex Reflects Focused Internal Attention*, 56 *NEUROPSYCHOLOGIA* 393 (2014).

<sup>316</sup> See Sawyer, *supra* note 299, at 149–50.

<sup>317</sup> See *id.*

<sup>318</sup> See *id.* at 149.

<sup>319</sup> See Sureyya Yoruk & Mark A. Runco, *The Neuroscience of Divergent Thinking*, 56 *ACTIVITAS NERVOSA SUPERIOR* 1, 1 (2014).

<sup>320</sup> See *id.* at 11.

<sup>321</sup> See *id.* at 11–12.

<sup>322</sup> See *id.* at 13.

### C. *Historical Studies*

One of the methodologies used in creativity studies is archival research, which examines the creation of works of art by reviewing the personal documents made by artists while they created masterpieces.<sup>323</sup> This Section focuses on the studies conducted by Robert Weisberg, a cognitive psychologist focusing on creativity, geniality, and expertise who shed light on the importance of expertise and task-relevant knowledge to the creative process from a historical perspective.

Weisberg's first two case studies are from the field of visual arts, specifically, masterpieces of Pablo Picasso.<sup>324</sup> The first work is *Les Femmes d'Alger (O. J. R. M.)* published in 1907.<sup>325</sup> Weisberg analyzed the creative process of this work by comparing X-ray images of the final product to sketches preserved by Picasso.<sup>326</sup> Weisberg described the various stages in Picasso's work as well as the parts in which Picasso used prior works.<sup>327</sup> However, the most important observation for this Article's purposes is the identification of external sources of Picasso's work.<sup>328</sup> Weisberg learned that the nude female figures in Picasso's work were based on and adapted from figures included in other painters' masterpieces.<sup>329</sup> For example, the kneeling female in the bottom-right part of Picasso's painting is very similar to the female in Paul Cezanne's work entitled *The Three Bathers*.<sup>330</sup> In addition, the two central female figures in Picasso's work are similar to the two women who appear in Goya's *Nuda Maja* and Manet's *Olympia*.<sup>331</sup> The general composition of Picasso's work is drawn from his colleague Henri Matisse's work, *Le Bonheur de Vivre*.<sup>332</sup>

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<sup>323</sup> For a description of this methodology, see Locher, *supra* note 242, at 132–34.

<sup>324</sup> See WEISBERG, GENIUS, *supra* note 203, at 193–208.

<sup>325</sup> See *id.* at 193–201.

<sup>326</sup> See *id.* at 196.

<sup>327</sup> See *id.* at 195–98.

<sup>328</sup> See *id.* at 194–201.

<sup>329</sup> See *id.* at 198–99.

<sup>330</sup> See *id.* at 198.

<sup>331</sup> See *id.*

<sup>332</sup> See *id.* at 199.

Weisberg conducted similar research regarding Picasso's masterpiece *Guernica*.<sup>333</sup> He explained that this work is substantially based on previous works of Picasso.<sup>334</sup> But, more importantly, Weisberg also noted that *Guernica*, which referred to the atrocities of the Spanish civil war, was substantially based on Goya's series of sketches entitled *The Disasters of War* from 1816.<sup>335</sup> Weisberg emphasized that several figures and positions presented in Goya's sketches appear, after stylistic adaptations, in Picasso's *Guernica*.<sup>336</sup>

Weisberg found similar findings in musical compositions.<sup>337</sup> He studied many of the early works of Wolfgang Amadeus Mozart and found significant reliance on other composers' works.<sup>338</sup> For instance, Mozart's first four piano concerti (K. 37, 29, 40, 41) did not contain any *original* music—they were adapted from the works of five other composers.<sup>339</sup> In addition, Mozart's three consecutive piano concerti (K. 107 nos. 1–3) composed in 1772 were actually the works of Johann Christian Bach (Johan Sebastian Bach's younger son) and were rearranged and orchestrated by Mozart.<sup>340</sup> A similar pattern was identified in Mozart's first symphonies and chamber compositions, which were stylized according to pre-classical styles and based on the compositions of young Bach and other German composers.<sup>341</sup> Likewise, Weisberg found reliance on prior works in Mozart's later compositions.<sup>342</sup> He argued that the finale of Mozart's Jupiter symphony—the last that Mozart composed—was based on five themes that were drawn from other composers' work.<sup>343</sup> Similarly, Mozart's three E-flat horn concerti was substantially based on Antoni Rosetti's horn concerti from the same period.<sup>344</sup>

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<sup>333</sup> See *id.* at 202–09.

<sup>334</sup> See *id.* at 202.

<sup>335</sup> See *id.* at 208.

<sup>336</sup> See *id.*

<sup>337</sup> See Weisberg, *supra* note 161, at 235–36.

<sup>338</sup> See *id.*

<sup>339</sup> See *id.* at 235.

<sup>340</sup> See *id.*

<sup>341</sup> See *id.* at 236.

<sup>342</sup> See WEISBERG, *GENIUS*, *supra* note 203, at 225.

<sup>343</sup> See *id.*

<sup>344</sup> See *id.* at 225–26.

Weisberg divided his studies into two categories of creativity. He described the first as reproductive creativity.<sup>345</sup> The category includes the *Guernica*, the structure of which Picasso based on his previous works.<sup>346</sup> Weisberg noted that these cases show this type of creativity occurs through the reproduction of prior knowledge without modifying its form and by adapting it to fit new needs through analogical transfer.<sup>347</sup> Weisberg described the second type of creativity as reproductive restructuring.<sup>348</sup> An example of this is Picasso's *Les Femmes d'Alger*, which is speculated to have been substantially restructured after Picasso visited an ethnographic museum and encountered primitive sculpture.<sup>349</sup> Weisberg inferred from these case studies that every work is linked to prior work and that every work has a preceding work, as the past is a crucial basis for innovation.<sup>350</sup> In light of these observations, Weisberg proposed a model that explains the use of task-relevant knowledge in creativity.<sup>351</sup> In contrast to the notion that creativity begins with the reception of input from the environment that is later processed according to stored knowledge (bottom-up model), he contended that task-relevant knowledge forms the perception of input from the environment (top-down model).<sup>352</sup> Thus, when a person identifies a new event in the environment, the mere identification is governed by the preexisting task-relevant knowledge already stored in his memory, which further evidences task-relevant knowledge's critical contribution to creativity.<sup>353</sup>

The studies presented in this Part—theoretical, empirical, and historical—all point to the same conclusion: They all focus, in one way or another, on the significant role task-relevant knowledge and

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<sup>345</sup> See Robert W. Weisberg, *Case Studies of Creative Thinking: Reproduction Versus Restructuring in the Real World*, in *THE CREATIVE COGNITION APPROACH*, *supra* note 271, at 53, 57–62.

<sup>346</sup> See *id.* at 57–58.

<sup>347</sup> See *id.* at 61–62.

<sup>348</sup> See *id.* at 63–69.

<sup>349</sup> See *id.* at 63–65.

<sup>350</sup> See WEISBERG, *supra* note 33, at 112–13. This notion is an explicit expression of the idea of progress in copyright law and is directly related to the difficulties with the current definition of the derivative work right.

<sup>351</sup> See *id.* at 114–18.

<sup>352</sup> See *id.*

<sup>353</sup> See *id.*

memory have in the cognitive process of creation and describe in different ways how these components are used by the author. These studies all show that the creative process includes the use of existing knowledge structures inherently and in a concrete way that is identifiable in different stages of the process and its outcomes. The use of knowledge structures is not limited to ideas (in copyright terms); it also includes the explicit use of expressions. Under this reading of the cognitive psychology literature on creativity, there is no qualitative difference between creative activities based upon ideas and those based on explicit expressions. The products of both are considered creative under these approaches. This is the main notion that this Article tries to extract from the cognitive psychology discourse on creativity. The next Part explains how this notion can be applied to copyright law and what implications it may have on different copyright doctrines.

## V. IMPLICATIONS FOR COPYRIGHT LAW

After establishing the notion that the creative process is characterized by two main processes—one of unfocused thought and generation of abstract ideas and the other of focused thought and crystallization of abstract ideas—and showing that the use of knowledge and memory (not limited to ideas but also to explicit expressions) is an inherent part of the creative process, this Part points out the implications of these notions on some aspects of copyright law and examines to what extent the legal doctrine matches the cognitive understanding of creativity. The Part argues that this notion has significant implications for copyright law’s originality requirement, derivative work right, and idea/expression dichotomy.

### *A. The Use of Prior Knowledge in the Creative Process and Copyright’s Originality Requirement*

The originality requirement is at the heart of copyright and aims to ensure that non-original works do not receive copyright protection.<sup>354</sup> The originality requirement is part of copyright’s statutory requirements in many jurisdictions but “originality” is

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<sup>354</sup> See 17 U.S.C. § 102(a) (2012).

not statutorily defined.<sup>355</sup> Section 102(a) of the Copyright Act states that “[c]opyright protection subsists, in accordance with this title, in *original* works . . . .”<sup>356</sup> Courts in many jurisdictions have struggled with defining the exact meaning of originality for copyright purposes. In the notorious *Feist Publications, Inc., v. Rural Telephone Service Co.* case, the Supreme Court ruled that in order to prove originality for copyright purposes, a work should be an independent creation of the author and should be somewhat creative.<sup>357</sup> The ruling did not end the debate on the meaning of originality and creativity in copyright law.<sup>358</sup> Without delving into the various approaches to creativity and originality in copyright law, it seems that one definition is not in dispute—for a work or any part of it to be original, it must be the author’s independent creation.<sup>359</sup>

If originality, in its undisputed meaning, is the *sine qua non* for copyright protection, the importance of reliance on prior knowledge and memory in the process of creation has significant implications for the requirement. If this Article’s argument is correct, it is likely that every author’s work is based on components (including expressions) from other authors’ works. Further, if an author’s work is based on another author’s expression, then it may, under certain circumstances, be a derivative work.<sup>360</sup> Conversely, if a work is based on ideas or unprotected expression, then it is an “original work.”<sup>361</sup> As a result, many works of authorship are not copyrightable and remain in the public domain. Courts sometimes indeed distinguish between different components of a work that are

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<sup>355</sup> See *id.* § 101.

<sup>356</sup> See § 102(a) (emphasis added).

<sup>357</sup> See 499 U.S. 340, 346 (1991) (“[O]riginality requires independent creation plus a modicum of creativity.”).

<sup>358</sup> For a review of the case’s influence on other jurisdictions and the creative choice test for originality, see Daniel J. Gervais, *Feist Goes Global: A Comparative Analysis of the Notion of Originality in Copyright Law*, 49 J. COPYRIGHT SOC’Y U.S.A. 949 (2002), and Elizabeth F. Judge & Daniel Gervais, *Of Silos and Constellations: Comparing Notions of Originality in Copyright Law*, 27 CARDOZO ARTS & ENT. L. J. 375 (2009), which examines the reception of the creative choice test in different jurisdictions.

<sup>359</sup> See *Feist*, 499 U.S. at 345.

<sup>360</sup> See 17 U.S.C. §§ 101, 103(b), 106 (2012).

<sup>361</sup> See *id.* § 102(a).

copyrightable and those that are not.<sup>362</sup> Nevertheless, the discourse in copyright law and specifically in court decisions is about the copyrightability of a work as a whole.<sup>363</sup> The notions in this Article indicate that this may not be the right question to ask and that courts should instead ask what components of the work are copyrightable.

This Article emphasizes the mismatch between the legal doctrine and the cognitive understanding of creativity. In the context of the originality requirement, there is a match as far as the principles of the doctrine are considered but a mismatch as to its application in courts. The few doubts raised here articulate the potential contribution that notions from cognitive psychology of creativity may have for copyright law.

#### *B. The Creative Process and the Author's Independent Contribution*

Commentators such as James Boyle, Jessica Litman, and R. Keith Sawyer argue that copyright law perceives creativity from a “romantic” point of view attributed to the western world.<sup>364</sup> This romantic point of view understands creativity as a moment of revelation in which a work is created from nothing—a light bulb moment—and portrays the author as an independent individual working in the dark until the awaited breakthrough.<sup>365</sup>

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<sup>362</sup> See *Oracle Am., Inc. v. Google Inc.*, 750 F.3d 1339, 1357–58 (Fed. Cir. 2014) (stating that the question of whether the originality requirement should be tested for each component of the work is usually discussed in an infringement analysis and specifically in computer software cases). The common test is the abstraction-filtration-comparison test. At the first stage, the work is abstracted to its components. At the second stage, each component is scrutinized using the idea/expression dichotomy and other copyright doctrines that deny liability for infringement. At the third stage, the protected components are compared to the allegedly infringing ones. Courts differ as to whether the second stage refers to copyrightability in general or only as a defense against an infringement action. It may be that the notions from cognitive psychology support the application of the second stage in the copyrightability part of the analysis regarding any type of work, not only computer software.

<sup>363</sup> See *supra* note 362.

<sup>364</sup> See James D.A. Boyle, *The Search for an Author: Shakespeare and the Framers*, 37 *AM. U. L. REV.* 625, 629 (1987); Jessica Litman, *The Public Domain*, 39 *EMORY L. J.* 965, 965 (1990); R. Keith Sawyer, *The Western Cultural Model of Creativity: Its Influence on Intellectual Property Law*, 86 *NOTRE DAME L. REV.* 2027, 2033 (2011).

<sup>365</sup> See ORLY LOBEL, *TALENT WANTS TO BE FREE: WHY WE SHOULD LEARN TO LOVE LEAKS, RAIDS, AND FREE RIDING* 140 (2013).



Many scholars criticize the romantic approach to creativity. The first stage of the criticism relied on the common notion that no work could be created out of nothing and that it is obvious that one needs to rely on prior knowledge to innovate.<sup>366</sup> This notion was so obvious to critical scholars that some of them referred to it as a cliché.<sup>367</sup> Kwall suggested, however, that in spite of the fact that every work is based on previous knowledge, the individual contribution of the author to new work still justifies copyright protection.<sup>368</sup> Nevertheless, it seems that the romantic approach to authorship has lost credit, at least in academic scholarship for the last two decades. It also seems that this intuitive notion is becoming more substantial as knowledge becomes more and more available and technological advancements make it more accessible and usable for further innovation.<sup>369</sup>

In their important and constitutive book, which was the first to offer an alternative to the romantic author approach to copyright law, Martha Woodmansee, a professor of English literature, and Peter Jaszi, an acclaimed copyright scholar, showed that the legal norms in copyright law are a product of the romantic author approach and are not compatible with the social understanding of creativity.<sup>370</sup> Woodmansee showed that the romantic author approach is a product of the eighteenth century and is a short episode in comparison to the documented history of creativity in earlier centuries, and that, in the past, the creative process was perceived as a social action that is not attributed to one individual.<sup>371</sup> On the

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<sup>366</sup> See S.C. GILFILLAN, *THE SOCIOLOGY OF INVENTION* 77–78 (1935); Paul Goldstein, *Derivative Rights and Derivative Works in Copyright*, 30 J. COPYRIGHT SOC'Y U.S.A. 209, 218 (1983); Andrew Hargadon & Robert I. Sutton, *Building an Innovation Factory*, HARV. BUS. REV., May–June 2000, at 157, 158–59.

<sup>367</sup> See Litman, *supra* note 364, at 966.

<sup>368</sup> See ROBERTA ROSENTHAL K WALL, *THE SOUL OF CREATIVITY: FORGING A MORAL RIGHTS LAW FOR THE UNITED STATES* 2 (2010).

<sup>369</sup> See, e.g., Naomi Abe Voegtli, *Rethinking Derivative Rights*, 63 BROOK. L. REV. 1213, 1214 (1997).

<sup>370</sup> See *THE CONSTRUCTION OF AUTHORSHIP: TEXTUAL APPROPRIATION IN LAW AND LITERATURE* (Martha Woodmansee & Peter Jaszi eds., 1994).

<sup>371</sup> See Martha Woodmansee, *On the Author Effect: Recovering Collectively*, in *THE CONSTRUCTION OF AUTHORSHIP: TEXTUAL APPROPRIATION IN LAW AND LITERATURE*, *supra* note 370, at 15; Martha Woodmansee, *The Genius and the Copyright: Economic and Legal Conditions of the Emergence of the "Author,"* 17 EIGHTEENTH-CENTURY STUD. 425, 426 (1984).

basis of these notions, Jaszi argued that the influence of the romantic author approach on copyright law led to a gap between the social understanding of creativity and the legal one, which makes it difficult for copyright law to adapt and govern more complex models of creativity and specifically multiple-authorship works.<sup>372</sup>

The notions from the cognitive psychology of creativity as presented in this Article show that this understanding of creativity leads to a somewhat different conclusion. Although the cognitive process of creation is characterized by substantial reliance on prior task-relevant knowledge and memory, an inseparable part of creativity has to do with the unfocused thought of the author and cognitive processes that are original to him.<sup>373</sup> Therefore, it seems that the creative process is not a romantic individual process in the sense that the author is the sole origin of the work, but, on the other hand, it is not based solely on prior knowledge and works. In fact, there is a significant match between copyright's originality requirement and the cognitive understanding of creativity that articulates the author's original contribution. These notions could be the basis for further discussion of the place of the individual author in the process of creation and in copyright law.

One example of the implications of such a discussion is the joint authorship doctrine in copyright law. Section 201(a) of the Copyright Act states that "[t]he authors of a joint work are co-owners of copyright in the work."<sup>374</sup> A "joint work" is defined as "a work prepared by two or more authors with the intention that their contributions be merged into inseparable or interdependent parts of a unitary whole."<sup>375</sup> One of the most debated aspects about this doctrine revolves around what contribution to a joint work is considered authorship. The two main positions were argued by copyright scholars Melville Nimmer, who asserted that the contri-

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<sup>372</sup> See Peter Jaszi, *On the Author Effect: Contemporary Copyright and Collective Creativity*, in *THE CONSTRUCTION OF AUTHORSHIP: TEXTUAL APPROPRIATION IN LAW AND LITERATURE*, *supra* note 370, at 29 [hereinafter Jaszi, *Author Effect*]; Peter Jaszi, *Toward a Theory of Copyright: The Metamorphoses of "Authorship,"* 1991 DUKE L. J. 455 (1991) [hereinafter Jaszi, *Theory of Copyright*].

<sup>373</sup> See Jaszi, *Author Effect*, *supra* note 372; Jaszi, *Theory of Copyright*, *supra* note 372.

<sup>374</sup> 17 U.S.C. § 201(a) (2012).

<sup>375</sup> *Id.* § 101.

bution does not have to be copyrightable on its own,<sup>376</sup> and Paul Goldstein, who argued that the contribution should be independently copyrightable.<sup>377</sup>

The findings from the cognitive psychology of creativity may offer guidance here. If the process of creation involves independent contribution of the author, and the process does not make a distinction between ideas and expressions, there is no reason to think that an independent contribution to a work of authorship—which consists of ideas and is therefore not copyrightable on its own—is not a creative contribution that amounts to authorship. Thus, Nimmer’s claim that non-copyrightable contributions to a work of authorship could qualify as joint authorship may fit well with the understanding of creativity.<sup>378</sup>

### C. *The Use of Prior Knowledge and the Right to Make Derivative Works*

The right to make derivative works is a relatively new right in copyright law’s bundle of rights and was first introduced in the Copyright Act of 1976.<sup>379</sup> It expanded the preexisting adaptation right and absorbed the case law’s expansion of the reproduction right.<sup>380</sup> The derivative work right granted authors exclusive rights to works that are “based upon one or more preexisting works, such

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<sup>376</sup> See 1 MELVILLE B. NIMMER & DAVID NIMMER, *NIMMER ON COPYRIGHT* § 6.07[A][3] (2015). Nimmer’s approach was explicitly rejected by the Second Circuit in *Childress v. Taylor* and later in the Ninth Circuit as well. *Id.* (citing 945 F.2d 500, 506 (2d Cir. 1991)). The Seventh Circuit, however, accepted Nimmer’s approach and decided that the contribution of ideas could be sufficient for joint authorship. *See id.*

<sup>377</sup> See PAUL GOLDSTEIN, *GOLDSTEIN ON COPYRIGHT* § 4.2.1.1, at 4:7 (3d ed. 2005 & Supp. 2007). Goldstein’s approach was followed in the *Childress* case and in subsequent cases in the Ninth Circuit. *See supra* note 376 and accompanying text.

<sup>378</sup> For an analysis of different tests for the constitution of joint authorship that attempts to solve the problems with the intent requirement based on notions from creativity studies, see Gregory N. Mandel, *Left-Brain Versus Right-Brain: Competing Conceptions of Creativity in Intellectual Property Law*, 44 U.C. DAVIS L. REV. 283, 357–61 (2010). Mandel contends that the requirement for joint authorship would be a “non-market-substitutable-contribution.” *Id.*

<sup>379</sup> See 17 U.S.C. § 106 (2012).

<sup>380</sup> See Oren Bracha, *The Ideology of Authorship Revisited: Authors, Markets, and Liberal Values in Early American Copyright*, 118 YALE L.J. 186, 224–33 (2008); Goldstein, *supra* note 366, at 211–15; Jed Rubinfeld, *Freedom of Imagination: Copyright’s Constitutionality*, 112 YALE L.J. 1, 49–52 (2002).

as a translation, musical arrangement, dramatization, fictionalization, motion picture version, sound recording, art reproduction, abridgment, condensation, or any other form in which a work may be recast, transformed, or adapted.”<sup>381</sup> With regard to the application of the current doctrine, Nimmer argued that the right to make derivative works is “superfluous” because the making of a derivative work will (almost) always involve reproduction of the underlying work;<sup>382</sup> however, Professor Pamela Samuelson argued that the derivative work right could be understood in a different way that could exist independently from the reproduction right.<sup>383</sup> On the normative level, however, most commentators have argued that the current, broad definition of the derivative work right is unjustified.<sup>384</sup>

The derivative work right’s current definition raises significant questions and difficulties, which focus mainly on the tension between first and second authors, and on the constraints that the right casts on the development of new expressions. The difficulties involve two different aspects of the derivative work right. The first aspect is the scope of the right in light of its statutory definition. This aspect is substantial because it caps the borders of the legal discourse on derivative works and sets its start and end points and

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<sup>381</sup> 17 U.S.C. § 101 (2012).

<sup>382</sup> See 2 NIMMER & NIMMER, *supra* note 376, § 8.09[A][1].

<sup>383</sup> See Pamela Samuelson, *The Quest for a Sound Conception of Copyright’s Derivative Work Right*, 101 GEO. L. J. 1505 (2013).

<sup>384</sup> For a critique of the derivative work right based on freedom of speech, see Christina Bohannon, *Taming the Derivative Work Right: A Modest Proposal for Reducing Overbreadth and Vagueness in Copyright*, 12 VAND. J. ENT. & TECH. L. 669, 688 (2010); Niva Elkin-Koren, *Cyberlaw and Social Change: A Democratic Approach to Copyright Law in Cyberspace*, 14 CARDOZO ARTS & ENT. L.J. 215, 277–83 (1996); Neil W. Netanel, *Copyright and a Democratic Civil Society*, 106 YALE L.J. 283, 347–64 (1996); Voegtli, *supra* note 369, at 1213–58. For an economic critique on the derivative work right, see Shyamkrishna Balganesh, *Foreseeability and Copyright Incentives*, 122 HARV. L. REV. 1569 (2009); Shubha Ghosh, *Market Entry and the Proper Scope of Copyright*, 12 INT’L J. ECON. & BUS. 347, 351 (2005); Goldstein, *supra* note 366, at 227; Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 1048–68 (1997); Lydia Pallas Loren, *The Changing Nature of Derivative Works in the Face of New Technologies*, 4 J. SMALL & EMERGING BUS. L. 57, 77–78 (2000); Glynn S. Lunney, *Reexamining Copyright’s Incentives-Access Paradigm*, 49 VAND. L. REV. 483, 650–53 (1996); Chris Newman, *Transformation in Property and Copyright*, 56 VILL. L. REV. 251, 252–53 (2011); Stewart Sterk, *Rhetoric and Reality in Copyright Law*, 94 MICH. L. REV. 1197, 1215–17 (1996); Voegtli, *supra* note 369, at 1241–45.

the number of cases to which it applies. The second aspect concerns remedies for copyright infringement. This aspect determines the right's strength to a great extent—that is, the stronger the remedies granted to the copyright holder (or the prohibition on whoever is not), the stronger the right, and vice versa.

In the absence of empirical data that could offer guidance, at least on a utilitarian basis, as to the proper balance between first authors' interests and second authors' interests, it is possible to turn to findings from cognitive psychology's account of creativity.<sup>385</sup> Moreover, as a recent study shows, there is good reason to doubt whether authors are in fact rational agents that respond to market incentives. Based on behavioral experiments, Stephan Bechtold, Christopher Buccafusco, and Christopher Sprigman showed that authors' decision to borrow from existing works or create works "from scratch" is not affected by copyright law's incentives, but by their subjective belief about the difficulty of innovation.<sup>386</sup> These findings emphasize the importance of understanding cognitive psychology's account of creativity and applying it to the law in order to create more efficient copyright doctrines. The notion regarding the use of prior knowledge and memory in the creative process and the lack of qualitative differences between ideas and expressions in this context warrant asking whether copyright law's distinction between derivative and original works is justified.

As far as the first aspect is concerned—the scope of the derivative work right—there is a strong link between the legal norm and the cognitive understanding of creativity. If, for example, it turned out that the scope of the derivative work right is very broad, but the reliance on expressions during the process of creation is marginal, it would raise the question of whether such a legal right is needed and justified. In contrast, if the scope of the derivative work right is narrow, vague, and applied to a limited set of cases, but the use of preexisting expressions is inherent to the process of creation (as

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<sup>385</sup> For a similar approach, see Fishman, *supra* note 2, at 1341, and Jeanna C. Former, *A Psychology of Intellectual Property*, 104 NW. U. L. REV. 1441, 1458–59 (2010).

<sup>386</sup> See Stephan Bechtold, Christopher Buccafusco & Christopher Jon Sprigman, *Innovation Heuristics: Experiments on Sequential Creativity in Intellectual Property*, 91 IND. L. REV. 1251, 1297 (2016).

this Article attempts to show), scholars should ask whether the legal doctrine should better reflect the behavioral aspects of creativity.

But, more important, due to the significance of the use of prior knowledge and memory in the cognitive process of creation (which is not limited to ideas but also includes explicit expressions), a better understanding of the right to make derivative works is warranted. The making of a derivative work is, in its nature, a creative activity under cognitive approaches to creativity and is not qualitatively different than an original work (that is not based on protected expressions). This observation has great importance as far as the scope of the derivative right and its intersection with the reproduction right are concerned. This Article argues that the reproduction right should apply only to mere reproductions, which are inherently uncreative and therefore qualitatively different from derivative or original works.<sup>387</sup>

To illustrate this point, consider the following example. Assuming that the literary masterpiece *The Catcher in the Rye*<sup>388</sup> is an original work that is creative under copyright law, there are three different alternatives for works based on this work. One alternative is the making of a literary work whose main character is a sixteen-year-old teenager who runs away from home to the big city and reaches important notions about the life of adults during his journey. This work would probably be considered original under copyright law because it only uses the general underlying idea in the original work, and would also be considered creative under the cognitive approaches presented above. Another alternative is the making of a literary work entitled “60 Years Later: Coming Through the Rye,” which presents the relationship between Mr. C. (a reference to Holden Caulfield) and the 90-year-old author

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<sup>387</sup> A reservation is appropriate here. There obviously are reproductive actions, in copyright terms, that use explicit copyrighted expressions without adding original expressions to them which are very creative in the cognitive behavioral sense. One example is the use of an expression while changing its mode of presentation or presenting it in a different context that gives it new meaning. These activities are typically allowed under the fair use doctrine. This Article does not focus on the interrelations between fair use and reproduction, but it seems that the fair use doctrine sufficiently accounts for the cognitive notions regarding the creativity of such activities.

<sup>388</sup> See generally J.D. SALINGER, *CATCHER IN THE RYE* (Little, Brown & Co. 1951).

who created his character and refers to specific scenes from the original work.<sup>389</sup> This work would fall under the category of derivative works because it uses explicit expression from the original work and contributes additional originality. It would also be considered creative under the cognitive approaches that view the recombination of prior knowledge as part of creativity. A third alternative would be a literal repeat of the original work's text while changing the name of the main character Holden Caulfield to James Sheffield. Under copyright law, this is considered a reproduction despite the marginal changes. In contrast to the two first alternatives, the third option is not considered creative under the cognitive approaches because it is an exact restoration of knowledge without any other creative components.

This example illustrates the gap between the legal categories and the cognitive understanding of creativity. The cognitive psychology approaches do not distinguish between knowledge types such as ideas or expressions as a basis for creativity. They also do not distinguish between the uses of different knowledge types along the timeline of creativity—meaning, in the input, processing, or output stages of creativity. Copyright law, in contrast, is interested almost solely in the output stage and in the final creative product.

At many points, there is a match between the cognitive understanding of creativity and copyright law. Thus, as far as the use of any type of knowledge (ideas or expression) at the time of input and processing is concerned, copyright law allows such use because these stages of creativity are not governed. At the output stage, so long as the use of knowledge led to the creation of ideas or unprotected expressions (whether they are in the public domain or allowed under the fair use doctrine), it is generally not considered an infringement under copyright law as well.

The mismatch between copyright law and the cognitive understanding of creativity is most strongly evident in the use of protected expressions during the output stage of creativity. When this occurs during a creative activity that involves an original contribution of the second author, a derivative work is sometimes made.

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<sup>389</sup> These were the facts that led to the decision in *Salinger v. Colting*, 607 F.3d 68 (2d Cir. 2010).

While the law distinguishes between a derivative work and an original work, under the cognitive understanding of creativity both are creative activities. In contrast, while the law makes almost no distinction between derivative works and mere reproductions, the cognitive approaches to creativity view derivative works as part of creativity but not reproductions. It so happens that while the cognitive approaches to creativity views the use of prior expression in the output stage of creativity as an inherent part of the creative process, the legal doctrine sometimes prohibits this behavior and categorizes it as copyright infringement (see Figure 1).

Figure 1: The Components of the Creative Process Under Each of the Theories of Creativity<sup>390</sup>

Components	Idea	Method	Fact	Expression	Thought	Education	Technical Skill	Aesthetic Criteria	Analytical Skill
<b>Copyright Law</b>	Not Protected 391	Not Protected 392	Not Protected 393	Protected (if original) 394	Not Protected	Sometimes Protected 395	Not Protected	Sometimes Protected 396	Not Protected
<b>Wallas</b> <sup>397</sup>									

<sup>390</sup> The + sign in this table indicates that, under the relevant stage and the relevant approach, the knowledge type in the specific column is being used. Empty cells indicate that the relevant knowledge type is not being used.

<sup>391</sup> See 17 U.S.C. § 102(b) (2012).

<sup>392</sup> See *id.*

<sup>393</sup> See *id.*

<sup>394</sup> See *id.*

<sup>395</sup> Knowledge acquired through education may sometimes be a protected expression. For example, a painter that studies the cubism style and acquires knowledge about the visual way in which Picasso expressed the minotaur figure is acquiring knowledge of an explicit expression. If the painter uses Picasso's minotaur figure as part of his acquired education, he uses a protected expression.

<sup>396</sup> Aesthetic criteria are often considered as methods, facts, or abstract ideas that are not copyrightable. Nevertheless, aesthetic criteria at their early stages in a specific creative field may be considered as explicit copyrightable expression. This is the case when a second author wishes to use explicit expressions from a previous work in the same field because of the aesthetic value he attaches to them. For example, assuming the Picasso was the first to express the female body in a non-proportional way in which the organs are presented as cubes, it is possible to think of such an expression as copyrightable. A second author who applies this aesthetic criterion may be using a protected expression. Whether this would be considered a use of expression or a use of a mere idea depends of the level of abstraction in which the idea/expression dichotomy is referred to.

<sup>397</sup> See generally WALLAS, *supra* note 33.



Preparation		+	+	+		+	+		
Incubation	+				+				
Illumination	+				+				
Validation		+	+	+		+	+	+	+
<b>Amabile</b> <sup>398</sup>									
Preparation		+	+	+		+	+	+	+
Response Generation	+				+				+
Response Validation		+	+	+		+	+	+	
Task-relevant Skills		+	+	+		+	+	+	
Creativity-relevant Skills	+				+				+
<b>Runco</b> <sup>399</sup>									
Problem Presentation					+				
Ideation	+	+	+	+		+	+	+	+
Evaluation		+	+	+		+	+	+	+
Declarative Knowledge			+	+				+	
Procedural Knowledge	+	+				+	+	+	+
<b>Guilford</b> <sup>400</sup>									
Evaluation		+	+	+		+	+	+	+
Cognition	+				+				+
Generation	+	+	+	+		+	+	+	
<b>Gabora</b> <sup>401</sup>									
Unfocused Thought	+				+				
Focused Thought		+	+	+		+	+	+	+
<b>Finke</b> <sup>402</sup>									
Generate	+	+	+	+				+	
Explore					+				+

To illustrate the spectrum of the match between the cognitive process of creation and copyright law, this Article returns to the *Cather in the Rye* example.<sup>403</sup> The match between copyright law and

<sup>398</sup> See generally AMABILE, CONTEXT, *supra* note 48.

<sup>399</sup> See generally Runco & Chand, *supra* note 74.

<sup>400</sup> See generally GUILFORD, *supra* note 102.

<sup>401</sup> See generally Gabora, *supra* note 111.

<sup>402</sup> See generally FINKE, WARD & SMITH, *supra* note 121.

<sup>403</sup> See generally SALINGER, *supra* note 388.

the cognitive approaches to creativity is reflected by the fact that the law allows making future works based upon Salinger's book in different ways. Thus, it is possible to make another book that tells the story of a teenager going through complex adolescence in which he critically looks at adult life without it constituting copyright infringement. Such a work would rely substantially on prior knowledge of various types such as ideas, education, and aesthetic criteria from the first work. A different type of use that reflects the match between copyright law and the cognitive approaches to creativity is the use of explicit plot lines from the original work during the input and processing phases, so long as the output does not include these expressions. Copyright law also allows the use of explicit scenes and plot lines, and even the character of Holden Caulfield, to express a different mode of expression that substantially changes their original meaning. Under the fair use doctrine, it would probably be permissible to use the character of Holden Caulfield and plot lines from the book to criticize the oppression of minorities in a certain country without it constituting copyright infringement. This would also allow reliance on prior knowledge. The mismatch between copyright law and the cognitive approaches to creativity exists when explicit protected expressions are used to make a new work of authorship—a sequel, for example. This was the case in *Salinger v. Colting*, where the court ruled that a sequel used explicit expressions from it and therefore infringed Salinger's copyrights.<sup>404</sup>

This Article argues that, in order to relax the tension between the legal doctrine and the cognitive approaches to creativity, it is first necessary to completely separate the reproduction right from the derivative work right. Second, in order to create a full match between the legal doctrine and the cognitive approaches to creativity, a shift in the remedies regime is warranted. This Article does not argue that these changes to the legal doctrine are justified solely by the cognitive understanding of creativity; they are also justified by intra-legal normative justifications to copyright law, which could not be discussed here. This Article does, however, argue that such changes could better fit the creative behavior of human beings and

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<sup>404</sup> See 607 F.3d 68, 83 (2d Cir. 2010).

that, if normatively justified, they should replace the current doctrine which does not fit the behavior it governs.

#### CONCLUSION

There is a mismatch between important copyright law doctrines and the cognitive understanding of creativity. Specifically, this Article focuses on the distinction between derivative works and original works, and the idea/expression dichotomy. To substantiate this claim, it discusses theoretical approaches to creativity as well as empirical and historical studies that focus on the process of creation. Under all approaches to creativity, the creative process could be divided into two main processes. The first is unfocused thought in which abstract ideas are generated. The second refers to the process of crystallization of the unfocused thought into concrete perceivable products using task-relevant knowledge and memory. Both explicitly and through a suggested reading of the literature, theoretical approaches to creativity view both ideas and expressions as knowledge components that are inherent to the creative process.

These notions from the cognitive psychology of creativity discourse assist in portraying several potential implications for copyright law. This Article explains that one implication could apply to the originality requirement in copyright law in that the analysis should shift from the originality of a work as a whole to the originality of its specific components, which courts often do already. It also suggests that post-modern approaches which require an idea of original contribution of an individual author are not consistent with the cognitive process of creation. While the cognitive understanding of creativity shows that many components of the creative process are based on prior knowledge, it also acknowledges a significant independent contribution of the author.

This Article's main goal is to articulate the argument that the distinction copyright law makes between derivative works (based on protected expressions) and original works (based on ideas and unprotected expressions) is an intra-legal normative distinction and is not based on any justification inherent to creativity. In this sense, this Article argued that there is no qualitative difference between

original works and derivative works under the cognitive approaches to creativity. Likewise, the idea/expression dichotomy also finds no justification in creativity. Therefore, if the distinction between derivative works and original works is merely a normative legal one, the mismatch between creativity and the law could justify a more careful evaluation of the normative intra-legal justifications to copyright law. Such evaluation will be developed in future research.