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You Want to Foster Creative Behavior? Try Behavioral Sciences Models

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ABSTRACT

Why do individuals confronted with a specific situation act creatively or not? To answer this question, the psychology of creativity needs to rely on comprehensive behavioral models allowing researchers to better identify the determinants of creative behavior and to be able to efficiently foster this behavior. Behavioral sciences precisely developed behavioral models that allow us to understand and influence a wide variety of behaviors. The present contribution argues for the use of behavioral sciences models in creativity research, and describes three main functions for creativity research: (1) a *heuristic function* (supporting the development of scientific knowledge about goal-directed creative behavior), (2) an *interventional function* (supporting the elaboration of efficient behavioral interventions to foster creative behavior), and (3) a *categorization function* (providing a clearer view of the types of interventions designed to foster specific creative behavior and of the behavioral drivers used).

KEYWORDS:

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Echoing the various calls to refocus on the study of behavior and behavioral measures in psychology (e.g., Baumeister et al., 2007; Bonetto et al., 2023), Bonetto & Arciszewski (2023) recently argued that creative behavior should be restored to its central place in the psychology of creativity. They highlighted the need to consider creative behavior as the main phenomenon of interest, and therefore the preferred dependent variable in the psychology of creativity. Refocusing on creative behavior involves the use of comprehensive models describing the determinants of creative behavior (i.e., why will a given individual behave creatively rather than following a well-known solution?). The use of such models allows for the identification of (causal) factors determining the frequency of occurrence of creative behavior. The identification of these drivers and barriers to creative behavior seems all the more crucial when it comes to understanding and fostering this kind of behavior in individuals. In other words, behavioral models can help us understand why individuals facing a specific situation act creatively or do not.

If we aim to design and implement effective interventions to foster creative behavior, then we must not deny the existence of all these variables, but consider that they belong to a set of predictors that correspond to various creative situations that we would be hard pressed to manage correctly. The aim of this proposal is not to redefine creativity, nor to eliminate the factors studied in the literature so far, but to specify the framework within which we can facilitate creative behavior in the most general and open way possible.

MODELS FROM THE CREATIVITY LITERATURE

We do not operate in a vacuum. The scientific field of creativity has attempted to build such models. However, these models are not without limitations. Some can be called '*models of creativity*'. These models are often very general, and seek to account for classes of factors which can impact creativity. However, these models precisely tend to take '*creativity*' as an outcome. They do not focus on creative behavior *per se*, and often do not clearly define which creativity-related variable is the concrete outcome of the model. Are they models describing the determinants of creative behavior itself? The frequency of occurrence of this behavior? The '*degree*' of creativity of the production resulting from this behavior? Do they rather focus on creative skills? Motivation to create? Creative mindset? Creative production? Do they suggest that all these variables are interrelated (a risky assumption; see Bonetto & Arciszewski, 2023)? In addition to this ambiguity as to their outcome, these models often present factors that are certainly interesting and important, but often difficult to concretely manipulate when it comes to fostering creative behavior. These models are therefore very interesting descriptive and conceptual tools, but seem difficult to use for interventional purposes. For instance, the Systems Model of Creativity (Csikszentmihalyi & Wolfe, 2014) suggests that

> 'creativity occurs at the interface of three subsystems: An Individual who absorbs information from the culture and changes it in a way that will be selected by the relevant Field of gatekeepers for inclusion into the Domain, from whence the novelty will be accessible to the next generation' (Csikszentmihalyi & Wolfe, 2014, p. 166).

The model therefore identifies three broad classes of interrelated factors to be considered when analyzing creativity (i.e., description). However, this is as far as the model goes. It does not aim to provide a detailed vision of which variables within each class (or 'subsystem') can represent drivers and/or barriers to creative behavior, and how they can concretely be used (i.e., interventional aspect).

Other models deal specifically with creative behavior, but tend to focus on specific classes of factors. This is the case, for example, of the model of Creative Behavior as Agentic Action (Karwowski & Beghetto, 2019), which focuses on cognitive factors such as creative potential, creative confidence, and perceived value of creativity. In this case, the concepts and the outcome are clearly defined, but the model relies only on cognitive factors. The same is true for Jauk's (2019) bio-psycho-behavioral model of creativity that also focuses on factors such as openness to experience, creative potential, or intelligence. These smaller-scale models thus do not consider other types of factors that also determine creative behavior (e.g., external and contextual factors such as organizational and personal context). They do not intend to address these factors, although the latter represent potential drivers for interventions aimed at fostering creative behavior. Some behavioral '*theories*' or '*approaches*' to creativity highlight the role of specific characteristics of environments and contexts (Cautilli, 2004), and envisage contextual changes as effective ways to foster creative behavior (e.g., Epstein & Laptosky, 1999). However, this time, these conceptions tend to overlook individual characteristics and cognitive factors, and they do not constitute structured and comprehensive behavioral models *per se*.

As we have shown, most interventions rely on quite general assumption of creative behavior, leaving a blurry feeling that we do not really know what we expect as a result, whether models mainly follow a cognitive perspective (improving cognitive abilities linked to creativity), a motivational perspective (motivating individuals to act creatively, overcoming inhibitions), or even a more specific assumption about better using one's capacity to bring originality into a task. The many shades of creativity's grey may need some framework to strengthen the interventions and the rationale for them. Recent approaches to modeling creative behavior seem to be in line with our argument. This is particularly true of Benedek's (2024) componential model that explains the effect of creative potential on creative achievement via creative behavior under the influence of the environment. However, this model does not address the frequency of occurrence of creative behavior, and the present contribution seeks to introduce an alternative: Behavioral sciences models.

To summarize, if the psychology of creativity seeks to refocus on the study of creative behaviors, the discipline needs to rely on comprehensive behavioral models (including individual and contextual factors) to better identify the determinants of such behaviors, and to be able to efficiently foster them.

WHAT ABOUT BEHAVIORAL SCIENCES MODELS?

Departing from these specific models of creativity with their aforementioned limitations, the present contribution argues for the use of the basic principles and insights of the behavioral sciences (which include psychology, but also economics, marketing…) to analyze creative behavior and identify the drivers and barriers to these behaviors.

> 'The behavioral sciences seek to understand the psychological, biological, social and environmental factors that influence behavior with a view to developing interventions and policies to help achieve societal, organisational or personal goals' (West et al., 2020, p. 451).

In other words, these disciplines aim to understand human behaviors and how to change them. The behavioral sciences develop behavioral models that allow us to understand and influence a wide variety of behaviors in numerous domains—from health (Van Bavel et al., 2020) to environment (Osbaldiston & Schott, 2012) or education (Kizilcec et al., 2020)—thus identifying regularities and general laws in such diverse and heterogeneous human behaviors. The COM-B model (Michie et al., 2011, Michie et al., 2014a), the Theory of Planned Behavior (Ajzen, 1991), or the Transtheoretical Model (Prochaska & DiClemente, 1982) are examples of well-known and widely used behavioral models.

These models have been successfully exploited to better understand why individuals adopt (or do not adopt) a wide variety of behaviors. Why not apply them to creative behaviors? Why not capitalize on their insights, supported by decades of scientific literature, to gain a better understanding of this particular behavior—creative behavior? This approach would present at least three main advantages or functions for creativity research, namely (1) a *heuristic function* (supporting the development of scientific knowledge about correctly identified creative behaviors), (2) an *interventional function* (supporting the elaboration of targeted behavioral interventions), and (3) a *categorization function* (providing a clearer view of the types of interventions designed to foster creative behavior and of the behavioral leverages used).

(1) The use of behavioral sciences models focused on creative behavior would be heuristically fruitful by helping creativity researchers to identify the drivers and barriers to this specific behavior. Researchers have already identified numerous individual and contextual factors (e.gpersonality, various intellectual abilities, social norms) and this large variety of factors seems particularly difficult to analyse and use because they cover almost all our psychological range. If those factors are nonetheless all useful to describe the creative process, the behavioral sciences models can provide fresh, structured, parsimonious, and evidence-based ideas to their reflections and hypotheses, and thus contribute to the understanding of creative behavior. Moreover, these models focus on a variable that is sometimes overlooked in the literature on creativity, even though it appears to be crucial: the probability of individuals engaging in the creative behavior under consideration.

Furthermore, the large number of creative behavior categories, ranging from '*little C*' to '*big C*' (Kaufman & Beghetto, 2009), as well as from artistic to scientific creativity, may be driven by similar or very different behavioral drivers that these models would allow to finely detail. Complementary to using behavioral models for heuristic purposes, they can also be employed as a study basis from which researchers can build an augmented model, implementing variables specifically tailored to creative behavior under study. Extended or augmented models of, for example, the Theory of Planned Behavior, have been developed for a wide range of behaviors, such as energy saving (e.g., Gao et al., 2017), health-related behaviors (e.g., Cheng et al., 2019), drug abuse (e.g., Armitage, 1999) or even entrepreneurial behavior (Lihua, 2021). For more than 30 years, researchers have been advocating for that particular use of behavioral models, creating, as some put it, '*avenues for further research*' (Conner & Armitage, 1998).

(2) They would also facilitate the elaboration of interventions aimed at fostering creative behavior. The identification of the drivers and barriers to creative behavior would allow researchers to design behavioral change techniques tapping on these factors in order to foster creative behavior. Behavioral change techniques refer to activities designed to change specified behavior patterns (Michie et al., 2011), here to foster creative behavior, for a specific population within a circumscribed environment, but still with a unique and comprehensive framework. These techniques, developed in the domain of behavioral sciences, can be matched with the specific drivers and barriers identified by behavioral models (e.g., education and training can be appropriate behavioral interventions in cases where the behavior is not adopted due to lack of capability, persuasion or incentivisation if we seek to motivate individuals to adopt the behavior; Michie et al., 2011). Altogether, the use of such models would offer a behavioral methodology for acting on creative behavior.

(3) These models would also offer categorizations of interventions designed to favor creative behavior according to the factors targeted (e.g., interventions aiming to enhance individuals capability, interventions aiming to increase individuals' motivation; Michie et al., 2011). In other words, the use of these models could structure and organize the scientific literature on how we can influence creative behavior, and make it easier to navigate in this one, thus contributing to the cumulative aspect of research in the field of creativity. As a collateral effect, this would also lead researchers to take a closer look at the behavioral drivers used in their studies and interventions. It is sometimes difficult to know what kind of determinant of creative behavior the interventions are tapping on (e.g., creative abilities, motivation to create; for a similar critique in the field of creativity training, see Hu et al., 2013), as well as to know the real nature of the creative behavior they try to improve (e.g., from general creativity in everyday work to technological innovation focus). Categorization of behaviors, interventions, and aims could generally allow more accurate targeting of improvements without wasting energy in ill-defined goals. Moreover, the

aim of our proposition is above all practical and dedicated to interventions aimed at fostering creative behavior. The extreme variety of factors impacting this specific behavior can be seen as detrimental to the understanding of possible actions, particularly when communicating with non-scientific stakeholders in intervention projects. The parsimony offered by behavioral science models would enable all the stakeholders involved to better grasp the stakes of an intervention without any specific hypothesis on the factors involved. Note, however, that smaller-scale models remain essential. They give researchers a deeper understanding of more specific yet critical aspects of creativity. In addition, they may be more directly translated into empirical research and, ultimately, may lead to the successful application of research findings in real-world contexts. Through the *categorization function* described, behavioral sciences models would offer a mapping of the drivers and barriers to a specific creative behavior in a specific context, which would then allow researchers to select a smaller-scale model offering a more precise understanding of these factors and ways of acting on them. In this sense, there would be complementarity between behavioral sciences models and smaller-scale models.

AN EXAMPLE: THE COM-B MODEL APPLIED TO THE STUDY OF CREATIVE BEHAVIOR

As we said previously, there is a plethora of behavior change models (e.g., 83 have been listed in Michie et al., 2014b). Among these models, we chose to use the COM-B model of behavior change (Michie et al., 2011, Michie et al., 2014a) as an example, because of its comprehensiveness. Indeed, this model was initially created as a result of the articulation between a systematic review of pre-existing models and a consultation with behavior change experts (see Michie et al., 2011).

The COM-B model posits that to engage in a specific Behavior (B), an individual needs to have the Capability (C), the Opportunity (O) and the Motivation (M) to engage in this behavior. The capability includes individuals' psychological and physical ability to perform the behavior; such as intelligence, knowledge, or decision-making skills. The Opportunity refers to the external physical and social factors that enable the behavior, mainly the physical resources, the social norms. The Motivation component stands for the internal processes that trigger or inhibit the behavior, such as attitudes, beliefs, or emotions. As a consequence, the model suggests that any behavior change requires acting on at least one of those interrelated components or their interactions (the three components interact to generate behavior; e.g., opportunity can influence motivation; see Michie et al., 2011, 2014a for further percisions). Because COM-B is a content free framework, it has been used to understand and change a wide variety of behaviors (e.g., covid-19 mitigation behaviors, West et al., 2020; health, McDonagh et al., 2018; mobility, Krusche et al., 2022).

How can we analyze creative behavior using the COM-B model? In line with this model, to engage in a specific creative behavior, an individual needs to have the capability, opportunity and moti-

vation to engage in this behavior. Creative behavior is driven by individuals' physical and psychological abilities (Capability). In addition to the physical capability to perform the creative behavior under study (e.g., adequate visual acuity for visual art production), numerous studies have documented the extent to which creative behavior is determined by psychological characteristics such as creative potential (e.g., Karwowski & Beghetto, 2019), creative self-efficacy (e.g., Michael et al., 2011), or creative confidence (e.g., Beghetto et al., 2021). Creative behavior is also determined by external and contextual factors, including both social and physical factors (Opportunity). Research in the field of creativity (and in particular the social psychology of creativity) identified factors linked to the social context in which individuals operate, and which are able to promote or inhibit creative behavior. These include, for example, social norms (e.g., Adarves-Yorno et al., 2007) and organizational culture and climate (e.g., Tesluk et al., 2011). Individuals also need the physical opportunity to perform the behavior under study (e.g., access the required materials). Finally, the occurrence of creative behavior in individuals is influenced by their internal processes that trigger or inhibit this type of behavior (Motivation). These motivational processes can be automatic (processes that do not enter conscious awareness) or reflective (involving plans or goals). For instance, we can cite creative self-beliefs (e.g., Karwowski & Barbot, 2016), emotions (e.g., Conner & Silvia, 2015), fear of negative evaluation (e.g., Bonetto et al., 2021), or even direct planning of creative behavior (Liu et al., 2023).

To give concrete examples, the creation of original paintings can be '*dissected*' on the basis of the COM-B model. Indeed, the probability for individuals to engage in the creation of original paintings a priori depends on individuals' physical capability (e.g., visual acuity, fine motor skills), psychological capability (e.g., attentional abilities, mental imagery, memory capacities, art knowledge), physical opportunity (e.g., availability of appropriate materials, model), social opportunity (e.g., availability of appropriate materials, artistic movement supporting the creation), automatic motivation (e.g., emotions guiding the artistic work) and reflective motivation (e.g., motivation to create an original piece, planification of the steps needed to create the artwork). Suppose, within the framework of this behavioral analysis, a population has, among other characteristics, a strong motivation to create but little knowledge of art, that is, a strong psychological motivation but weak psychological capability. In this case, there is no need to intervene on motivation, but rather to focus on improving this population's knowledge of art, which will enable them to be more creative when painting, by having a better knowledge of both painting techniques and artistic movements, raising for example, the possibility of analogies. We could also work on opportunities by setting up some art workshops. An intervention in terms of art education and training seems to be an effective strategy (Michie et al., 2011). In a very different domain, what are the potential determinants of the creation of new products by engineers working in a private company? Following the COM-B model, such creative behaviors depend on our engineers' psychological capability to create, such as domain-related scientific knowledge, cognitive ability, or creative self-efficacy, but we can exclude a priori the influence of engineers' physical capability, which would have little to do with the problem. The model tells us that our engineers' creative behaviors would be influenced by physical (e.g., time dedicated to R&D, materials & technology availability) and social opportunity

(e.g., organizational climate favoring/discouraging innovation), as well as automatic (e.g., novelty seeking) and reflective motivation (financial incentives, career development strategy). This time, suppose that engineers are highly skilled (capability) and that the organization provides an environment conducive to innovation (opportunity). If they do not act creatively, the problem could lie in engineers' motivation to create. As a consequence, behavior change techniques like persuasion or incentivization would be effective (Michie et al., 2011), for example by exposing individuals to messages arguing in favor of innovation or clearer salary increase perspective. In this example, targeted individuals already have all that is needed to be creative, only they do not want to be creative because they do not have any motivational triggers. Therefore, trying to directly improve creative abilities may be quite unnecessary in that case. Obviously, these examples are purely speculative, but they show how the COM-B model can represent, as a behavioral model, an interesting analysis grid for understanding and intervening in the field of creativity. This description of the COM-B model applied to specific creative behaviors highlights the complementarity between behavioral sciences models and smaller-scale models: once the category of drivers and barriers identified (related to capability, opportunity and/or motivation), researchers can pick a smaller-scale model in order to better understand and act on these drivers and barriers.

In a nutshell, following this model, any intervention seeking to foster creative behavior (the frequency of occurrence of this behavior) should tap in at least one of those interrelated components, each referring to a myriad of variables representing potential behavioral leverages. Figure 1. shows a summary of this proposition.

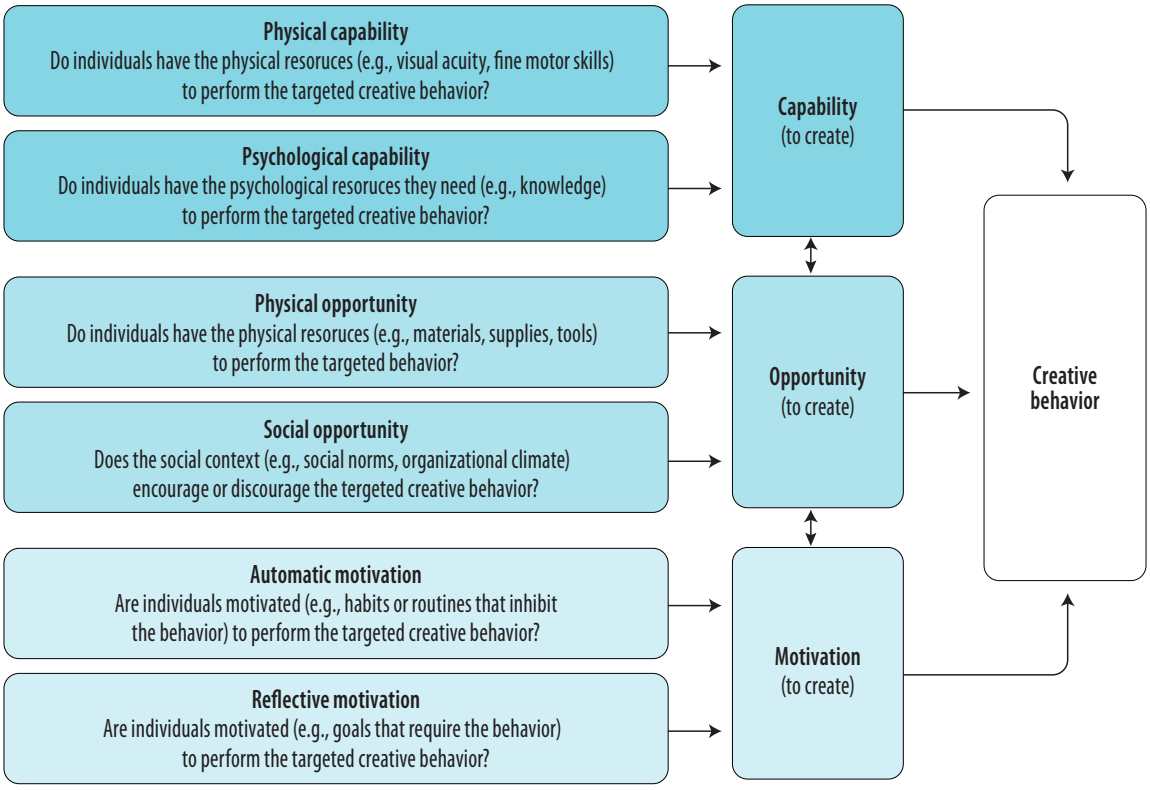

Figure 1. Using the COM-B model to understand and favor creative behavior

This rapid and relatively general demonstration has the merit of illustrating the extent to which the use of models derived from the behavioral sciences (here the COM-B model) in the study of creativity can help (1) to identify possible gaps in the literature and therefore hypotheses to be tested (heuristic function), which in turn leads (2) to new and more precise approaches for stimulating creative behavior (interventional function), all by means of (3) a summary and categorization of the factors that explain this kind of behavior (categorization function).

LIMITATIONS

The present proposition nevertheless suffers from a number of limitations and opens up perspectives that need to be discussed. First, as we said previously, there are many validated behavioral sciences models. Thus, one limitation would be the difficulty of choosing one model over another. However, these models have many overlaps in their components (Michie et al., 2011, 2014a), which makes it easy to find one's way around and speak a common language. The use of such models would offer greater transparency and make it easier to navigate the scientific literature (see categorization function). Second, One might find that some of the factors highlighted by these models are somewhat obvious (e.g., fine motor skills as a factor linked to individuals' physical capability to create original paintings). However, obvious or not, these factors need to be taken into account in any detailed analysis of creative behavior, since they are predictors (and can sometimes be a sine qua non) of that behavior. Third, behavioral science models can be used to better understand and manipulate the factors determining the appearance (or absence) of creative behaviors in a given population. However, they do not provide us with information on the level of creativity of the productions resulting from these behaviors, nor are they able to grasp the individual competencies specifically related to creativity. If the behavioral interventions can be designed to globally set the conditions for creativity improvement, they do not set a precise goal to be reached by each participant but rather suppose that each one will benefit from the intervention independently from the fact that some of them may still be uncreative with good capacities, opportunities and motivation. There is therefore a real complementarity between these models and those derived from creativity research, some of which precisely focus on the level of creativity of productions. Fourth and finally, the use of behavioral science models does not address a problem already identified by creativity researchers (Forgeard & Kaufman, 2016): studies often fail to provide a rationale for its interventions, and so do not correctly define the reasons why it is beneficial to foster creativity in the specific context of the intervention. We suggest that *the reason why* is nevertheless better integrated in behavioral models since they are designed to work with an intervention aim in a defined environment. However, this latter problem lies well upstream of the question of the models used to analyze and influence creative behavior.

CONCLUSION

Behavioral sciences have been fruitfully solicited in the context of many behaviors related to major societal issues (Hallsworth, 2023). Creative behavior seems to be exempt from this trend, to date. We could imagine that the reasons for excluding it from the general behavior change analyses is the special status of creative behavior, often seen as difficult to define and described as a rarer and highly valued behavior. The idea of focusing on creative behavior in the field of creativity is not new in itself, but inserting this creative behavior into the vast array of behaviors that can be engineered through behavioral sciences represents a significant shift in perspective.

Models from the behavioral sciences could not only make a great contribution to the understanding of creative behavior, but also stimulate approaches aimed at fostering this specific type of behavior. We identified at least three main advantages or functions for creativity research: a *heuristic function*, an *interventional function*, and a *categorization function*. The aim of this contribution was to introduce this idea and to bring together the worlds of creativity and behavioral sciences.

References

Adarves-Yorno, I., Postmes, T., & Haslam, S.A. (2007). Creative innovation or crazy irrelevance? The contribution of group norms and social identity to creative behavior. *Journal of Experimental Social Psychology*, *43*(3), 410–416. https://doi.org/10.1016/j.jesp.2006.02.013

Ajzen, I. (1991). The theory of planned behavior. Organizational behavior and human decision processes, 50(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Armitage, C.J. (1999). Different Perceptions of Control: Applying an Extended Theory of Planned Behavior to Legal and Illegal Drug Use. *Basic and Applied Social Psychology*, *21*(4). https://doi.org/10.1207/S15324834BASP2104_4

Baumeister, R.F., Vohs, K.D., & Funder, D.C. (2007). Psychology as the science of self- reports and finger movements: Whatever happened to actual behavior?. *Perspectives on psychological science*, *2*(4), 396–403. https://doi.org/10.1111/j.1745-6916.2007.00051.x

Beghetto, R.A., Karwowski, M., & Reiter-Palmon, R. (2021). Intellectual risk taking: A moderating link between creative confidence and creative behavior? *Psychology of Aesthetics, Creativity, and the Arts*, *15*(4), 637–644. https://doi.org/10.1037/aca0000323

Benedek, M. (2024). On the relationship between creative potential and creative achievement: Challenges and future directions. *Learning and Individual Differences*, *110*, 102424. https://doi.org/10.1016/j.lindif.2024.102424

Bonetto, E., & Arciszewski, T. (2023). One "C" to Rule Them All: The Psychology of Creativity Needs to Refocus on Behaviors. *The Journal of Creative Behavior*, *57*(3), 339–341. https://doi.org/10.1002/jocb.590

Bonetto, E., Guiller, T., & Adam-Trojan, J. (2023). A Lost Idea in Psychology: Observation as Starting Point for the Scientific Investigation of Human Behavior. *Human Ethology*, *38*, 08–16. https://doi.org/10.22330/he/38/008-016

Bonetto, E., Pichot, N., Pavani, J.B., & Adam-Troïan, J. (2021). Creative individuals are social risk-takers: Relationships between creativity, social risk-taking and fear of negative evaluations. *Creativity. Theories–Research–Applications*, *7*(2), 309–320. https://doi.org/10.2478/ctra-2020-0016

Cautilli, J. (2004). Toward a behavioral theory of "creativity": A preliminary essay. *The Behavior Analyst Today*, *5*(1), 126–140. https://doi.org/10.1037/h0100138

Cheng, O.Y., Yam, C.L.Y., Cheung, N.S., Lee, P.L.P., Ngai, M.C., & Lin, C.-Y. (2019). Extended Theory of Planned Behavior on Eating and Physical Activity. *American Journal of Health Behavior*, *43*(3), 569–581. https://doi.org/10.5993/AJHB.43.3.11

Csikszentmihalyi, M., & Wolfe, R. (2014). New conceptions and research approaches to creativity: Implications of a systems perspective for creativity in education. In M. Csikszentmihalyi (Ed.), *The systems model of creativity: The collected works of Mihaly Csikszentmihalyi* (pp. 161–184). Springer. https://doi.org/10.1007/978-94-017-9085-7

Conner, T.S., & Silvia, P.J. (2015). Creative days: A daily diary study of emotion, personality, and everyday creativity. *Psychology of Aesthetics, Creativity, and the Arts*, *9*(4), 463–470. https://doi.org/10.1037/aca0000022

Epstein, R., & Laptosky, G. (1999). Behavioral approaches to creativity. In M. Runco & S.R. Pritzker (Eds.), *Encyclopedia of creativity* (Vol. 1, pp. 175–183). Academic Press.

Forgeard, M.J.C., & Kaufman, J.C. (2016). Who cares about imagination, creativity, and innovation, and why? A review. *Psychology of Aesthetics, Creativity, and the Arts*, *10*(3), 250–269. https://doi.org/10.1037/aca0000042

Gao, L., Wang, S., Li, J., & Li, H. (2017). Application of the extended theory of planned behavior to understand individual's energy saving behavior in workplaces. *Resources, Conservation and Recycling*, *127*, 107–113. https://doi.org/10.1016/j.resconrec.2017.08.030

Hallsworth, M. (2023). A manifesto for applying behavioural science. *Nat Hum Behav*, *7*, 310–322. https://doi.org/10.1038/s41562-023-01555-3

Hu, W., Wu, B., Jia, X., Yi, X., Duan, C., Meyer, W., & Kaufman, J.C. (2013). Increasing students' scientific creativity: The "learn to think" intervention program. *The journal of creative behavior*, *47*(1), 3–21. https://doi.org/10.1002/jocb.20

Jauk, E. (2019). A bio-psycho-behavioral model of creativity. *Current Opinion in Behavioral Sciences*, *27*, 1–6. https://doi.org/10.1016/j.cobeha.2018.08.012

Karwowski, M., & Barbot, B. (2016). Creative self-beliefs: Their nature, development, and correlates. In J. C. Kaufman & J. Baer (Eds.), *Creativity and reason in cognitive development* (pp. 302–326). Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781139941969.016

Karwowski, M., & Beghetto, R.A. (2019). Creative behavior as agentic action. *Psychology of Aesthetics, Creativity, and the Arts*, *13*(4), 402–415. https://doi.org/10.1037/aca0000190

Kaufman, J.C., & Beghetto, R.A. (2009). Beyond big and little: The four c model of creativity. *Review of General Psychology*, *13*(1), 1–12. https://doi.org/10.1037/a0013688

Kizilcec, R.F., Reich, J., Yeomans, M., Dann, C., Brunskill, E., Lopez, G., … & Tingley, D. (2020). Scaling up behavioral science interventions in online education. *Proceedings of the National Academy of Sciences*, *117*(26), 14900–14905. https://doi.org/10.1073/pnas.1921417117

Krusche, A., Wilde, L., Ghio, D., Morrissey, C., Froom, A., & Chick, D. (2022). Developing public transport messaging to provide crowding information during COVID-19: Application of the COM-B model and behaviour change wheel. *Transportation Research Interdisciplinary Perspectives*, *13*, 100564. https://doi.org/10.1016/j.trip.2022.100564

Lihua, D. (2022). An Extended Model of the Theory of Planned Behavior: An Empirical Study of Entrepreneurial Intention and Entrepreneurial Behavior in College Students. *Frontiers in Psychology*, *12*, 627818. https://doi.org/10.3389/fpsyg.2022.627818

Liu, T., Li, P., Zhang, S.Z., & Liu, W. (2023). Using Daily creativity planning to promote creative behavior. *The Journal of Creative Behavior*, *57*(1), 82–95. https://doi.org/10.1002/jocb.563

McDonagh, L.K., Saunders, J.M., Cassell, J., Curtis, T., Bastaki, H., Hartney, T., & Rait, G. (2018). Application of the COM-B model to barriers and facilitators to chlamydia testing in general practice for young people and primary care practitioners: A systematic review. *Implementation Science*, *13*(1), 130. https://doi.org/10.1186/s13012-018-0821-y

Michie, S., Atkins, L., & West, R. (2014a). *The behaviour change wheel. A guide to designing interventions*. Silverback Publishing.

Michie, S., Van Stralen, M.M., & West, R. (2011). The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implementation science*, *6*(1), 1–12. https://doi.org/10.1186/1748-5908-6-42

Michie, S., West, R., Campbell, R., Brown, J., & Gainforth, H. (2014b). *ABC of behaviour change theories*. Silverback Publishing.

Michael, L.H., Hou, S.T., & Fan, H.L. (2011). Creative self-efficacy and innovative behavior in a service setting: Optimism as a moderator. *The Journal of Creative Behavior*, 45(4), 258–272. https://doi.org/10.1002/j.2162-6057.2011.tb01430.x

Osbaldiston, R., & Schott, J.P. (2012). Environmental sustainability and behavioral science: Meta-analysis of proenvironmental behavior experiments. *Environment and behavior*, *44*(2), 257–299. https://doi.org/10.1177/0013916511402673

Prochaska, J.O., & DiClemente, C.C. (1982). Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy: Theory, Research & Practice*, *19*(3), 276–288. https://doi.org/10.1037/h0088437

Tesluk, P.E., Farr, J.L., & Klein, S.R. (1997). Influences of organizational culture and climate on individual creativity. *The journal of creative behavior*, *31*(1), 27–41. https://doi.org/10.1002/j.2162-6057.1997.tb00779.x

Van Bavel, J.J., Baicker, K., Boggio, P.S., Capraro, V., Cichocka, A., Cikara, M., … & Willer, R. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature human behaviour*, *4*(5), 460–471. https://doi.org/10.1038/s41562-020-0884-z

West, R., Michie, S., Rubin, G.J., & Amlôt, R. (2020). Applying principles of behaviour change to reduce SARS-CoV-2 transmission. *Nature human behaviour*, *4*(5), 451–459. https://doi.org/10.1038/s41562-020-0887-9

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