

Psychology of Creativity: Creative Sides #ukcreativity2018



**The UK Creativity
Researchers' Conference
22nd May 2018**



UNIVERSITY OF
SURREY

Welcome!

Welcome to the second UK Creativity Researchers' Conference! Today's event is held at Canterbury Christ Church University in their award winning Augustine House.

Our conference features Keynote speaker Todd Lubart and oral presentations from researchers around the globe as well as a speed research session and an interactive panel with Jonathan Plucker, Linden Ball, Janet McDonnell, and Todd Lubart. In addition we have sessions for poster presentations (with a prize for the best!), refreshments, a working lunch, wine reception, and – of course – networking opportunities throughout.

2018 Organising Committee:

Dr Ian Hocking, Canterbury Christ Church University

Dr Karl Jeffries, University of Central Lancashire

Professor Carolyn Mair PhD, Freelance Consultant

Dr Paul Sowden, University of Surrey



The aim of our event is to unite creativity researchers in order to share skills and ideas, build productive collaborations, and ultimately boost both the national and international impact of our work.

If you would like hold a similar conference or event at your institution, please speak to one of our organisers or email us: ukcreativityresearchers@gmail.com

You can also follow us on Twitter: @ukcreativity #ukcreativity2018

Standing Committee:

Dr Lindsey Carruthers, Edinburgh Napier University

Dr Shelly Kemp, University of Chester

Dr Gillian Hill, University of Buckingham



“Improving the visibility, impact, and strength of creativity research within the UK”

Overview of the Day (see conference programme for details)

9.30am – 10am	Registration and refreshments
10am-10.30am	Welcome! Welcome from the Organising Committee and Professor Jan Burns MBE, Head of the School of Psychology, Politics and Sociology at Canterbury Christ Church University
10.30am-11.20am	Key Note Speaker , introduced by Paul Sowden Todd Lubart - "Homo Creativus: The creative side of mankind" <i>Professor of Psychology at the Université Paris Descartes</i>
11.30am – 12.30pm	Academic Speed Networking , chaired by Carolyn Mair
12.30pm – 1.15pm	Lunch and Posters , poster session chaired by David Vernon
1.15pm – 2.30pm	Presentations , chaired by Ian Hocking: Jonathan Plucker - Creative articulation: The missing link in our understanding of the creative process Jeb Puryear - Defining creativity: How far have we come since Plucker, Beghetto, and Dow? Enikő O. Bereczki - The relationship between teachers' beliefs about creativity and classroom practice: What we assume and what we know Emma Threadgold - Designing creative spaces: The impact of a nature poster on divergent thinking Mark Batey - Capturing the creative problem solving process with a divergent thinking test: Preliminary validity evidence of a new measure
2.30pm – 3pm	Refreshments and Posters
3pm – 4.15pm	Presentations , chaired by Carolyn Mair: Amory H. Danek - Moment of truth: Can we trust our insights? Nicola K Shaghnessy - Creating differently: Imagining autism and the drama of neurodiversity Cathy J. Rogers - "I just got a popped up in my head". A qualitative analysis of how executive control processes contribute, positively and negatively, to children's creativity. Thomas R. Colin - A machine learning model of insight Frank Loesche - Your thought is no train: Using Eureka moments to trace creative processes
4.15pm – 5pm	Interactive Panel Discussion , chaired by Karl Jeffries Interactive Panel - Janet McDonnell, Linden Ball, Jonathan Plucker, and Todd Lubart
5pm – 6pm	Closing words and wine reception
6pm – 7pm	Please join us at The Three Tuns for a post-conference drink

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Exploring the effects of 4-weeks mindfulness training on creativity with students participating in a transformative leadership course

Camolie M. N. M. Fagerberg
The University of Edinburgh

In today's fast-paced and complex business environment, creativity and innovation are of upmost importance for survival and economic prosperity. Future leaders need to effectively problem-solve and find creative solutions to novel problems. This research aimed to provide further support for a suggested link between mindfulness and creativity (Lebuda, Zabelina, & Karwoski, 2016). This mixed methods research followed a 4-week Summer School in Transformative Leadership. Participants (n=7) trained in mindfulness and single case analysis of pre-, mid-, and post-measures were conducted for mindfulness, divergent thinking, cognitive processes associated with creativity, and perceived stress. Mindfulness improved with medium effect sizes. The other measures were all small effect sizes. Through visual inspection of the data it was clear that the 4-week training had initiated transformation within participants. The results showed that creativity was expressed in an individual manner and with a lot of variability in measures. This suggested potential confounding variables involved with creativity. Overall, both mindfulness and creativity measures showed an increasing trend from pre- to post-measures. Creativity may be enhanced through mindfulness which is highly valuable for students and future leaders who are required to come up with and implement innovative solutions.

On the application of different creativity tests in KuBiK5

Wida Rogh, Caroline Theurer, Nicole Berner, Frank Lipowsky, and Baptiste Barbot
FHNW University of Applied Sciences and Arts; University of Kassel; University of Applied Sciences and Arts Northwestern in Switzerland; Pace University; Yale University

The research project KuBiK5 (Impact of Arts Education on Creativity in Fifth Grade) investigates how arts activities in and out of school environments influence creativity development during the first year of lower secondary education (ISCED 2). Funded by the Mercator Foundation, Germany, KuBiK5 is a quantitative longitudinal study with two measurement occasions (Rogh, Berner, Theurer & Lipowsky, 2017). Over 1,000 students (mean age = 10.52; SD = .51) from 54 school classes across three German states (North-Rhine-Westphalia, Hesse and Saxony) were enrolled. At the beginning of fifth and sixth grade, students completed measures tapping into school factors, activities in several artistic fields as well as personality traits and cognitive abilities. Additionally, parent questionnaires informed on the socio-economic status, family activities and parental attitudes towards education, creativity and the arts. As the field of creativity research faces ongoing challenges regarding the psychometric measurement of creativity and deploys a range of assessment approaches (Barbot, 2016), students' creativity was assessed with three different test instruments. The Test for Creative Thinking – Drawing Production (Urban, 2004) and a Test Battery for Divergent Thinking (Berner, Theurer & Lipowsky, 2012) were administered to the full sample. In addition to these two paper-pencil tests, the tablet-based Crealyx (Barbot, 2017) was used in a subsample of participants. The presented poster introduces the KuBiK5 project and presents results on the students' creativity using creativity scores of all three assessment approaches. Ongoing psychometric measurement issues will be discussed.

**A study exploring the relationship between visual imagery vividness and creativity
utilising a new experimental methodology**

Freya H. Lenton, Kathryn J. Friedlander and Philip A. Fine
The University of Buckingham

Despite recent studies by Palmiero and colleagues (2011, 2015), the role played by visual imagery vividness (VIV) in relation to creativity and imaginational 'overexcitabilities' (Piechowski & Cunningham, 1981) remains unclear. Previous literature has established that there is a spectrum of individual differences in VIV (D'Anguilli et al., 2013). Most previous studies of VIV use self-reports, such as the VVIQ (Marks, 1973); however, such results are subjectively-based, impossible to benchmark (Kaufman, 1983), and potentially based on schematic reconstruction. Furthermore, experimental measures such as the Rey-Osterrieth complex figure test (Rey, 1941; Osterrieth, 1944) and Marks' photographic recollection test (Marks, 1973), which uses a matrix format, typically measure recall of spatial layout, potentially using memory traces laid down by articulation or mnemonic strategies. The current study therefore proposes a new experimental paradigm to address these issues. Sixty-three participants completed the VVIQ and took part in the novel recall task, involving two colourful and detailed pictures which were displayed for 90 seconds each. After a brief interval, participants were asked 14 questions about visual features (e.g. size, shade, orientation and shape) of items within the original two pictures. Features were deliberately selected to circumvent attempts to reconstruct details through articulatory or reconstructive processes, thus exploring the ability to 'reimagine' the intact pictures in vivid detail. Results of the VVIQ and the novel task were normally distributed, but uncorrelated and this is interpreted in the light of depictive (Kosslyn, 1980) and non-depictive (Pylyshyn, 1981) theories of visual imagery. Results from both the VVIQ and the novel task were also compared to responses on the RIBS self-report creativity scale (Runco, 2001). Unexpectedly, results showed no relationship between VIV and RIBS; however, results of an ongoing follow-up study employing the K-DOCS (Kaufman, 2012), to explore the relationship between VIV and specific creative domains, will also be reported.

Notions of self as predictors of creative cognition

Nicholas LeBoutillier and Lucy T. Irving
Middlesex University

This poster presentation reviews two studies examining the relationship between self, affect, personality, and creative cognition. Whilst research into Mindfulness focuses on its beneficial effects on physical and mental health we show that it may also facilitate creativity. We investigated the independent roles of the five facets of mindfulness, affect, and personality in predicting performance on creativity tasks. Step-wise multiple regression analyses on 191 participants revealed independent positive effects for both of the ability-mindfulness measures Describe and Observe in performance on the three creative cognition measures. Analyses also showed that both Negative Affect and Openness to New Experience made significant contributions in predicting performance on the three target variables. In a further study, employing 176 participants, we also investigated the roles of two Psychological Mindfulness measures and personality in predicting creative cognition performance. Again, hierarchical regression analyses revealed that these measures of self-awareness showed significant positive and independent effects on creativity. Findings from both of these studies are explained in the context of self, personality and creativity. In particular, they assess how our knowledge of self and the applications of self-awareness foster creative thinking.

Creativity, visual imagery and schizotypy: Traits underlying creativity in artists and non-artists

Lucy T. Irving and Nicholas LeBoutillier
Middlesex University

The poster presents the findings from the first author's doctoral research into traits and abilities underlying creativity. The author discusses the measurement of creativity, and presents research looking at whether visual imagery and subclinical traits ('schizotypy') influence creative ability. The poster has three sections; the first looks at literature on the relationship between visual imagery and creativity; the second focuses on subclinical, psychological traits which have been linked to creativity, and the final section looks at the relationships between these traits in artists and non-artists. The results show that the link between schizotypal traits and creativity is weak, but that visual imagery abilities appear to play an important role in various types of creativity, in both artists and non-artists.

Once upon a time: Collaborative creativity of children and adolescents in story writing

Pinar Oztop and Michaela Gummerum
Plymouth University

Although there is research on how peers collaborate in scientific contexts, children's collaboration in other domains (e.g., arts, creative writing) and collaborative creativity received less attention (Vass, 2007; MacDonald, Miell & Morgan, 2000). Social perspective coordination is the socio-cognitive capacity to differentiate and coordinate social perspectives of self and others (Selman & Schultz, 1990) and is thought to promote children's interactional skills (Selman, Watts, & Schultz, 1997). Yet, the role of social perspective coordination for collaborative creativity in children has not been investigated. Likewise, unlike its emphasis in adult creativity literature (Amabile, 1996), the role of intrinsic motivation for collaborative creativity in younger ages is unexplored. The current studies assessed age differences in collaborative creativity with a particular focus on social perspective coordination and intrinsic motivation using a collaborative story-writing task. The first study was conducted in England with 93 students (10-14 years old) from primary and secondary schools. We assessed age differences in collaborative creativity and how social perspective coordination and intrinsic task motivation affected collaborative creativity. Group creativity and social perspective coordination scores of older children were significantly higher than younger ones. However, younger students displayed higher intrinsic motivation scores. The second study was conducted in Turkey with 162 students (10-14 years old) from a secondary school. Groups were randomly assigned to either experimental condition, in which the task cohesion was manipulated, or control condition. The same variables of the first study were assessed using the collaborative story-writing task. The results of the first study were replicated. Additionally, creativity of groups in two conditions was compared and children in the task cohesion condition had more creative stories than children in control groups. Thus, similar to research on the development of individual creativity (Mouchiroud & Lubart, 2002), collaborative creativity was found to develop with age. Social perspective taking coordination, age and task cohesion were found as predictors of children's collaborative creativity achievements. However, despite its importance in adult literature (Amabile, 1996), intrinsic motivation was not found to be a predictor of collaborative creativity in younger ages.

Solo or group dancing? Factor analyses of contemporary dance students' creative achievements

Lucie Clements and Jon May

University of Chichester & Plymouth University

The self-report Creative Achievement Questionnaire (CAQ) uses a biographical approach to investigate ten individual domains of achievement as well as total achievement. It is often used to identify highly creative participants and is the only creativity measure to include the dance domain. In its validation, Principal Components Analysis (PCA) with varimax rotation gave a three-factor solution (Expressive; Visual; Performance) explaining 54.37% of the variance. In forcing a two factor solution, the authors note 'the arts versus science dichotomy of the two-factor solution' (p. 46), yet dance did not load. In our study, 149 first-year contemporary dance degree students (Male = 37, Female = 112) with a mean age of 20.25 years (SD = 1.99) and 8.24 years of dance experience (SD = 4.35) completed the CAQ. Maximum Likelihood Factor Analysis with oblimin rotation was undertaken to explore the existence of one domain-general factor. Four factors with eigenvalues ≥ 1 were extracted, indicating no higher-order factor. A PCA with varimax rotation also resulted in four factors with eigenvalues ≥ 1 (Visual; Verbal; Performance; Auditory) accounting for 54.45% of the variance. A two-factor solution accounted for 32.55% of the variance, with no clear theoretical structure, or arts-science dichotomy. Dance items again did not load but the original factor structures were not replicated either. The CAQ was originally validated in student participants (mean = 21 years of age), yet creative achievement is defined as 'the sum of creative products generated by an individual in the course of their lifetime'. Further, many items relate to technical rather than creative achievement (e.g. 'I have danced with a recognized dance company'). Conclusion: the CAQ is not suitable for assessing creative potential in dance students.

Social measuring of creativity

Carlos Guillem-Aldave and Rafael Molina-Carmona

University of Alicante

One of the most recent changes that our society is experiencing is brought about by the social action of numerous individuals who are connected through new technologies. In this research we propose to take advantage of the social potential of these tools, such as social networks, to strengthen research on the measurement of creativity. We propose a system for measuring creativity based on the social valuation systems that have been introduced in social networks. We start from the fact that the creativity of individuals is manifested through the products they are able to create, so that the attributes of a product also characterize the individual who created it. Therefore, a way of measuring the creativity of an individual is evaluating and measuring the creative attributes of the products he or she created. The main elements of the measuring model are the product, its creator, and the evaluators that assess it. The social way of evaluation is introduced thanks to the large amounts of evaluators that could participate in the process. The work of the evaluators is assessed by assigning them a level of confidence. This level of confidence is assigned and updated considering the expertise of the evaluator but also his or her behaviour during the evaluation process. The combination of a large set of evaluators, their anonymity, and their assessment, have led to a more objective and unbiased system of evaluation and measuring.

Can professional jewellery designers using Consensual Assessment Technique (CAT) achieve an appropriate level of inter-rated agreement when judging a specific jewellery design creativity task?

Mala Siamptani

University of Central Lancashire

With the assessment of creativity having been of great interest to researchers, a number of methods have been developed and implemented, including: divergent thinking tests, self-assessment inventories, and judgments on products. The consensual assessment technique (CAT) (Amabile, 1982) is a commonly used technique for the assessment of creativity, according to which the best judges of creativity are experts of the specific domain in question. Baer and McKool (2009) advocate that CAT can indeed be implemented to judge creativity in just about anything that can be considered imaginative or original work. Thus, a variety of experimental studies were made possible, in creativity research, by previous scholars' work in developing and validating CAT. This poster reviews existing research on the use of CAT within the design domain. The research strategy used is a reflection of the theories being investigated and in extending such research this study has been designed to explore whether CAT can be used as a measure of jewellery design creativity. As required when applying the consensual assessment technique, artworks were collected and assessed by professional jewellery designers for their level of creativity, technical execution and aesthetic appeal. These data were then analysed for inter-rated agreement, in addition to having their relationship with creativity investigated. The findings of this study are particularly significant due to the fact that the consensual assessment technique has never before been used as a measure of creativity within jewellery design. Hence, due to the lack of research in this area, a benchmark should be established for further studies.

Working memory in insight versus non-insight problem solving: A meta-analysis

Ken Gilhooly

Brunel University London and Melbourne University

The role of executive functions (e.g., attention, inhibition, working memory) in insight problem solving are at present somewhat unclear despite an upsurge of relevant empirical research. The business as usual approach to insight problem solving, which proposes no essential difference between insight and non-insight problem solving, suggests that working memory and executive functions would have a prominent role in solving such problems, similarly to non-insight, incrementally solvable, problems. The special process view would be compatible with a reduced role for executive processes and a large role for unconscious processes not limited by central executive capacity. These approaches thus make different predictions about correlations between working memory measures and insight problem solving. This paper systematically and quantitatively reviews available individual difference studies of working memory, executive functions and problem solving. From an initial search, 8 studies were suitable for meta-analysis. The overall effect as shown in the Forest Plot, falls just short of significance on a 2 tail test, but is in the direction predicted by the special process theory. Studies 1 and 6 were somewhat low in power (70% and 75% for medium size effects, respectively) and may have reduced the pooled effect. We suggest that insight problems involve a mix of special processes and business as usual which leads to a small effect overall in terms of correlation differences with working memory, which are hard to detect without large N.

Between the lines: Belief and doubt in the creative writing process

Emily P. Corrie and Carla Gibbes

Regent's University London

Although research into the science of creative writing has exploded in recent years (Forgeard, Kaufman & Kaufman, 2013), much of it focuses on the writer's personality—often noting the writer's eccentric or psychopathic tendencies (Sternberg, 1985). Though illuminating, such research promotes the (romantic) myth that creative writing is a talent reserved only for a special breed of people born, it seems, wielding a pen. Yet, as evidenced by the current popularity of creative writing courses, coaching, and meet up groups, hopeful writers are turning to the craft later in life and the process of writing—how to develop it—has, itself, become a topic of discussion. This qualitative, longitudinal study seeks to explore the creative writing process as it is experienced by creative fiction and non-fiction writers who have recently turned to writing from other careers. In an effort to more accurately capture their lived experience, participants will reflect on their process in journal entries over the course of two months while engaged in a book-length project. Research has shown that creativity is hampered when extrinsic goals are made salient (Amabile, 1985), yet writers seeking publication must balance their own intrinsic motivation to write with the extrinsic pressure to produce something valuable to the market. It is expected that this study will afford a unique perspective into what motivates writers to write and how they navigate the potential anxiety and self-doubt that may arise throughout the process when their work lacks the critical acclaim and certainty of more established writers. This poster will present a rationale for the study and explore preliminary findings in relation to education and psychotherapy/coaching fields.

The relationships between cognitive reserve and creativity. A study on American aging population

Barbara Colombo, Brendan Daneau, and Alessandro Antonietti

Catholic University of the Sacred Heart, Milan, Italy

The Cognitive Reserve (CR) hypothesis suggests that the brain actively attempts to cope with brain damage by using pre-existing cognitive processing approaches or by enlisting compensatory approaches. This would allow an individual with high CR to better cope with aging than an individual with lower CR. Many of the proxies used to assess CR indirectly refer to the flexibility of thought. The present paper aims at directly exploring the relationships between CR and creativity, a skill that includes flexible thinking. We tested a sample of 72 adults (aged between 45 and 78) assessing both their level of CR and their creativity. To evaluate the CR we used the proxies commonly used in literature, namely, three subtests from the WAIS (vocabulary, similarities, and digit span), and the years of education. We also used an ad-hoc test asking people to report how frequently they tend to perform activities that are believed to increase the CR. We asked them to describe their main occupation (present or past) and coded each occupation as creative or not creative. Results (controlling for age-related differences) showed that scores from the WAIS correlated positively with creativity performance, even though correlations varied across the subtests. Focusing on the frequency and type of activities that people perform, and comparing individuals who have or had a creative job to those with a routine job, it emerged that creativity influences the CR. This effect was more relevant than the level of job complexity. Implications for the study of CR and aging are discussed.

The creativity of artists: How artists' conceptions of creativity compare to established definitions within the field of creativity research

Verity Turner

University of Central Lancashire

The field of creativity research has seen rapid growth since Guildford's call-to-arms during his address to the American Psychology Association conference in 1950. Due to its potential application across a variety of domains, creativity attracts interest from a varied collection of practitioners, researchers, and academics. This has resulted in a range of contrasting concepts, terminology, assessment measures and methodological debates, with each researcher bringing their own interpretation and approach (Kharkhurin, 2014). While this diversity can add to the richness of the subject, the lack of a unifying definition for creativity is problematic (Kaufmann, 2003; Puryear, Kettler & Rinn, 2016; Sternberg & Lubart, 1999; Weisberg, 2015). In 2012 Runco and Jaeger laid out a Standard Definition listing 'Originality and Effectiveness' as the key criteria of creativity, but while this concept has been widely adopted in the field, a number of debates continue. Strands of creativity research that concentrate on the output or process of creativity, may more easily formulate a definition because there is an aspect that is quantifiable. The same cannot necessarily be said for artistic creativity, as this may not culminate in the production of a tangible outcome. Although a number of studies have examined the artistic process (see Mace & Ward, 2002; Nelson & Rawlings, 2007), a fundamental understanding of artistic creativity is under-developed in relation to other areas of creativity research. Indeed, there are few studies that specifically investigate what creativity means to artists – the people most readily identified as creative by the general public (Glăveanu, 2011, 2014). This study considers the relevance of established theories in relation to artists and, through qualitative insider-research, offers insights into the practice of artists with the aim of exploring new concepts and establishing stepping stones between the fields of Creativity Research and The Arts.

Divergent thinking and pretend play: is the relationship reciprocal?

Sarah E. Rose and Ruth Pettitt

Staffordshire University

There is considerable evidence of a positive association between young children's divergent thinking skills and pretend play. Furthermore, there is some evidence that engaging in pretend play may increase divergent thinking. The aim of this study was to assess whether this relationship might be reciprocal, that is, whether engaging in divergent thinking improved children's pretend play. Fifty-seven 4-year-old children individually participated in a 10-minute task either involving questions requiring divergent thinking (alternate uses, instances, and pattern meaning tasks) or involving control questions all requiring a yes or no answer. Directly after answering the questions each child completed The Affect In Play Scale-Preschool task (Kaugars & Russ, 2009), involving the researcher introducing a set of play items, acting out a story stem and then encouraging the child to continue the story for 5-minutes. This play task was then coded by an independent researcher using the criteria developed by Kaugars and Russ on six quality measures (positivity, type of play, imagination, elaboration, organisation and comfort). No significant differences were found between the pretend play of children who had completed the divergent thinking questions compared to the control questions. However, children in both conditions demonstrated high levels of pretend play. Therefore, it is possible that the adult interaction and questions used in both tasks may have benefited children's pretend play. Nonetheless, no evidence for divergent thinking improving pretend play was found. Therefore the relationship between pretend play and divergent thinking does not appear to be reciprocal.

Preschooler touchscreen use, divergent thinking & problem-solving

Stephanie Powell and Elena Hoicka

University of Sheffield

Following the iPad's successful launch in 2010, significantly more preschoolers access and use touchscreens (Ofcom, 2017). Despite this, little is known about the influence of touchscreens on preschooler cognitive development, including divergent thinking (DT) and problem-solving (PS). Previous television-watching research indicated media use may have a negative influence on DT and engagement in creative activities (Vandewater, Bickham & Lee, 2006; Williams, 1986). Compared to televisions, touchscreens offer more interactivity and thus have potentially beneficial features (Christakis, 2014). Furthermore, ethnographic research suggests touchscreens could facilitate creativity (Marsh et al., 2015). However, no psychological research has investigated this proposition yet. The current study begins to explore this area using behavioural measures of DT (Unusual Box Test; Bijvoet-van den Berg & Hoicka, 2014), PS (GATTeB; Reindl, Beck, Apperly & Tennie, 2016) and parental surveys. Parents of 24- to 47-month-olds are asked to report on their children's touchscreen use (including types of apps used) and engagement in non-digital activities. Correlations will be used to assess whether different activities have positive relationships with DT and PS scores. Additionally, correlations will be used to establish whether touchscreen use displaces otherwise potentially beneficial activities, as suggested by Vandewater et al (2006). This exploratory study is on-going, and 84 children will be recruited. The results will give novel insight into whether touchscreen use relates to DT and PS and will update the existing evidence base. This is valuable for research, parents and policy-making. Additionally, it will provide a foundation for experimental research designs to establish causal pathways between touchscreen use and creative thinking.

Deficits in flexible thought in Stroke Aphasia: Will deficits in control lead to more creativity?

Lucy S. Cogdell-Brooke, Hanah E. Thompson, and Paul Sowden

University of Surrey

Our semantic system pervades all aspects of life: from getting dressed, to posting a letter. It uses stored knowledge (BALL goes with GOAL) and executive mechanisms to use knowledge in a contextually appropriate way (BALL goes with DANCE). Patients with Stroke Aphasia (SA) have comprehension impairments- not from a loss of knowledge (SALT goes with PEPPER) but impaired contextually appropriate use of knowledge (spreading SALT on an icy path) and an overreliance on automatic retrieval and semantic relationships. Damage to the executive system is linked to limited creative, flexible thought. Executive processes search and select novel ideas from the semantic system. Intriguingly, however, some patients with executive and semantic deficits have been shown to display increased creativity, with researchers suggesting executive control restricts and constrains creativity. We predict that the involvement of executive processes depends on the nature of the task - spontaneous, fluid retrieval (divergent thinking) requires unconstrained thinking, compared with selecting distantly related associates (convergent thinking). SA patients provide the unique opportunity to make a critical test between competing hypotheses regarding the necessity of executive components in flexible thought. A sample of SA patients with damage to prefrontal and/or temporoparietal regions and matched controls will complete a non-verbal divergent and convergent categorisation task. We predict that patients with lesions to prefrontal regions will perform better on the divergent task where their deficits in control will allow them greater unrestricted exploration, however, they may struggle to remain task focused due to this lack of constraint.

The hidden workforce: An exploratory study of the lived experiences of Black, Asian and Minority Ethnic women in the fashion industry

Susan E. Jean

London College of Fashion, University of the Arts London

The womenswear market of the fashion industry in Britain is estimated to be worth over £27 billion annually. It employs millions of people worldwide, many of whom are women and/or minority ethnic; yet the fashion industry continues to perpetuate narrow views of their standards, namely, to be “thin, rich and white.” Recently, in the media, the lack of diversity in the fashion industry has attracted considerable attention, although the emphasis has been on the catwalk models. However, there has been much less focus given to the people who work behind the scenes. Previous research has indicated that Black, Asian and Minority Ethnic (BAME) women are amongst the most marginalised groups within organisations and society as a whole. The aim of this study was to explore and highlight the lived experiences of BAME women who work in fashion organisations. Six participants were interviewed using a one-on-one, semi-structured format. Data was analysed using interpretative phenomenological analysis methodology and four key themes emerged from the transcribed interviews: (1) I can't be myself; (2) there's no one who looks like me; (3) hitting a concrete wall; and (4) staying positive gives me strength. The findings indicated that BAME women experienced a lack of belonging, had experienced discrimination in the workplace, felt that their ethnicity was a barrier to advancement and overall, had a lack of support from their peers and/or managers.

Improvisation: A GIFT for interdisciplinary research.

Klara Łuczniak and Frank Loesche

CogNovo, Plymouth University

Improvisation as a form of vivid artistic practice highlights exploration, risk-taking, surprise, and collaborative skills by reinforcing real-time creative decision-making (Caines, Heble, 2015). In this talk, we argue that research in a dynamic, multiple disciplinary setting might be framed and understood as an improvisational practice. We consider the following four principles essential for this type of research: Generosity, Interdependence, Free exploration, and Trust (GIFT). Furthermore, we suggest that outcomes and results benefit most if these principles are explicitly integrated into the scientific process (Loesche & Łuczniak, 2017). Our approach is informed by the experience within CogNovo, an interdisciplinary doctoral training programme fostering research on Cognitive Innovation (Maranan, Loesche, & Denham, 2015). Cognitive Innovation, both as a field of scientific investigation and a strategy for research and innovation, adopts a multiple disciplinary approach. In a self-referential and incremental process, the engagement with research in this field not only changes the outcome, but necessarily also changes the field, the researchers involved, and the process of Cognitive Innovation itself (Denham & Punt, 2017; Kristensen, Loesche, & Maranan, 2017). This is particularly true in collaborations since ‘communal processes and knowledge’ contribute to a larger extent. Consequently, interdisciplinary research, often conducted collaboratively, cannot be planned ahead entirely but needs ongoing readjustment and coordination. However, such an improvisational approach does not replace preparation or scientific rigour. On the contrary, the proposed GIFT principles contribute to an environment which allows multiple disciplines to address complex real-world problems in a more effective and concise way. The collected case studies of CogNovo projects demonstrates how applying of the GIFT principles shifted research beyond expected boundaries and resulted in unexpected outcomes: multiple disciplinary collaboration, novel research methodologies, academic impact, and original public engagement activities.

Taking everything in: A new approach to leaky attention and creative achievement

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Research into creative achievement has looked at the role of diffuse early attention; i.e. leaky sensory gating that allows seemingly irrelevant information to be noticed. This is believed to enhance creativity by keeping the mind open to a wider range of possibilities, enabling the generation of more original ideas. However, creative individuals also need strong executive function to manage this greater flow of information. Although a variety of tasks have been used to measure this in adults, including Latent Inhibition (LI) tasks, these measures do not adapt well to other populations and therefore new behavioural measures are needed. As a first step towards this goal, we are benchmarking adult performance on Perceptual Load (PL) tasks against LI, in order to establish their concurrent validity as a measure of filtering related to creativity. Similar to LI tasks, which assess whether an individual remains aware of irrelevant stimuli, PL performance depends on the ability to screen out distractors. In addition, PL tasks are more reliable, have been used with a wide variety of populations and are part of a more established experimental framework. A sample of 120 university students (of which 70 have already been collected) will complete the following measures: 1) creative achievement; 2) creative potential (divergent thinking); 3) an LI task; 4) a low, medium and high PL task. Analysis will test 1) whether PL performance predicts LI, and 2) if LI and PL performance predict creative achievement. Covariates controlled for in the analysis include sleep, IQ, processing speed and Openness. This will provide evidence as to whether PL tasks can be used as a measure of leaky attention related to creativity. If so, they would enable the development of a new measure which could be used with other populations, including children.

Differences in environmental and individual predictors of creativity in three cohorts of young people

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Leeds Beckett University

Creativity and engagement with creative activities is associated with a range of outcomes including academic achievement (Gajda, Karwowski, & Beghetto, 2017) and wellbeing (Forgeard & Eichner, 2014). However, the focus on standardised testing in the curriculum has been criticised for leaving little room for creativity (Kaufman & Beghetto, 2009; National Advisory Committee on Creative and Cultural Education, 1999). The objective of this doctoral project is to investigate the environmental factors (e.g., leisure activities) and individual factors (e.g., personality, IQ) associated with creativity and wellbeing in young people. This will be implemented through a combined cross-sectional and longitudinal approach to investigate these factors in three cohorts of young people, secondary school students in year 10 (aged 14-15) and year 12 (aged 16-17) and first year university students (aged 18-20), over a two-year period. For the first phase of this study, participants (cohort 1: 134; cohort 2: 204; cohort 3: 71) completed a set of tasks and questionnaires on wellbeing, creativity, personality, cognitive abilities (intelligence, inhibition and working memory) and leisure activities. We present results from the first phase of the project, focusing on the individual and environmental predictors of creativity in the three cohorts. Linear regression was used to identify significant predictors of the creativity. The personality trait openness to experience consistently predicted creativity across the three cohorts, but participation in leisure activities predicted creativity differently for the three age groups.

Many sides of creativity: Different domains, cultures, and measurement techniques
Birsu Kandemirci, Elena Hoicka, and Danielle Matthews
The University of Sheffield

Children's creativity can be affected by different factors and it can be measured in various ways. In this comprehensive research, three factors were assessed which might play a role in children's creativity: technology, peer collaboration, and culture. Within three studies, three different approaches were used to measure creativity: Consensual Assessment Technique (CAT, Amabile, 1982), a linguistic measurement, and a standardised test (TTCT- Figural, Torrance, 1966). Creativity was measured in two domains: storytelling and drawing. Storytelling was measured in two countries: the UK and Turkey. A new way to measure creative storytelling was developed. Linguistic components of children's stories were evaluated to measure two divergent thinking skills (fluency and elaboration) in a more objective way. Children's stories were also measured by independent judges using the CAT. Touchscreen use did not affect children's creativity in either of the countries. Collaboration had a positive effect on the fluency of British children's stories, no effect on their overall creativity, and a negative effect on their elaboration. For Turkish children collaboration had a positive effect on the fluency and overall creativity of their stories, and no effect on the elaboration scores. Children's creative drawing was measured using the TTCT-Figural. The effects of children's perceived peer acceptance were also measured. Collaboration had a positive effect on children's fluency, however it did not affect their originality or elaboration. Overall these results provide a holistic evaluation of the effects of collaboration on creativity across different domains and different cultures.

Insight through interactivity
Frederic Vallee-Tourangeau, Wendy Ross, and Gaelle Vallee-Tourangeau
Kingston University

Psychologists working on problem solving (PS) focus their efforts on the factors that determine how a participant will overcome an impasse when working on so-called insight problems and experience a breakthrough or Aha! moment. This experience may offer an important window on the nature of creativity. The psychometric model casts intelligence and its correlates—such as high working memory capacity—as the main determinants of insight (Chuderski, 2014). In contrast, the interactivity model foregrounds interactions with a malleable problem presentation: insight arises through the actual manipulation of the problem elements (Vallée-Tourangeau, 2014). PS research primarily proceeds with tasks that prevent interaction, and hence the psychometric model is implicitly validated rather than challenged. We examined PS performance with an insight problem (the triangle of coins) presented online. Participants were invited to propose a solution to the problem every 30 seconds during a 10-min period (for a maximum of 20 solution attempts). The problem was presented on a computer, and proposed solutions were recorded by entering the position of the three tokens that should be moved on a 9 x 9 grid. Participants were assigned to one of three conditions: in the first condition (low interactivity), participants looked at a static image of the problem with hands on the table in front of them; in the second condition (high interactivity), participants could click and drag the coins on the grid; in the third (embodied high interactivity), participants worked on a physical board with actual tokens that could be moved (but still recorded their guesses through the computer interface). Cumulative solution rates were highest in the embodied condition; differences in performance were not systematically anticipated by measures of individual differences related to numeracy and visuo-spatial skills.

Thinking styles and creativity in medical practice: An exploratory survey
Paige Vanleer, Philip A. Fine, and Kathryn J. Friedlander
University of Buckingham

Applicants to UK medical schools are typically assessed for academic aptitude - using tasks which tend to be convergent in nature - as well as soft skills, such as empathy, respect and integrity. However, it is arguable that creativity - particularly divergent thinking - may also be key to successful medical diagnosis. Doctors often deal with uncertainties, sifting through incomplete, potentially conflicting and imprecise data in order to arrive at a diagnostic hypothesis, and must work off-protocol on occasions where this is in the best interests of patients (Sir Peter Rubin, chair, General Medical Council (GMC), 2013). In order to understand the role of creativity and divergent thinking in medical practice, we conducted a wide-ranging survey exploring the motivations and characteristics of medical students and qualified doctors. Following Friedlander and Fine's (2016) Grounded Expertise Components Approach, we captured data on thinking styles, cognition and creativity, among other things. Participants (n = 97) were drawn from a variety of settings: 11.3% from qualified practitioners; 29.9% from students at the University of Buckingham Medical School; and 58.8% from other UK medical school students. All participants were either qualified doctors or were training to become doctors. The survey included the following psychometric scales measuring thinking styles and creativity: Need for Cognition (Furnham & Thorne, 2013), Need for Closure (Roets & Van Hiel, 2011), the Runco Ideational Behavior Scale (RIBS; Runco et al., 2001), and the Kaufman Domains of Creativity Scale (K-DOCS; Kaufman, 2012). Participants also provided various demographic information including their hobbies. Hobby data is being interpreted using the Holland RIASEC codes (Gottfredson & Holland, 1996), which relate to personality styles. Results are currently being analysed; relationships between the scores on scales of creativity and thinking styles, together with those Holland codes (R,I,A) which relate to creative, intellectual and artistic pastimes, will be explored and presented.

I am my own biggest critic: The role of self-evaluation from human to computational creativity
Anna Jordanous
University of Kent

Theories of creativity over the years have long emphasised the importance of a creative entity being able to self-evaluate their progress to improve their work (Poincare 1929, Wallas 1945, Silvia & Phillips 2004). It is not enough to be able to produce new initial ideas or artefacts in a creative domain; the creative entity should be able to review what it is producing, reflect on their value, and critically consider how their creative processes can be enhanced by learning through self-evaluative feedback. A strong argument against the possibility of computers being able to demonstrate creativity is that computers can only follow their programming; they cannot demonstrate any critical awareness or appreciation of what they are doing, and how to improve. Philosophical and theoretical developments in computational creativity research, however, have emphasised the importance of building abilities for appreciation and aesthetic evaluation into computational models of creativity (Boden 2004; Colton 2008; Colton, Charnley & Pease 2011; Linkola et al 2017). In this paper, I shall analyse the progress of existing research that incorporates such self-evaluation abilities within computational models of creativity (e.g., Jordanous 2010; Saunders 2012; Colton, Goodwin, & Veale 2012; Perez & Perez, 2015). This analysis will contribute to understanding whether computational models of creativity are moving closer to what we recognise in humans as creativity. Using this analysis, I will conclude by tackling the tricky but fascinating question of whether so-called creative software can genuinely behave in ways which are driven not by their programming, but by critically reflecting on their progress.

**Perfectly creative? On the interrelationships and nurture of creativity and perfectionism
in elite dance training**

Sanna M. Nordin-Bates

Swedish School of Sport and Health Sciences

In dance, creativity is prized and increasingly recognized as an important part of being a “rounded dance artist”. Even classical ballet dancers (traditionally stereotyped as mostly fulfilling a choreographers’ creative vision), are now frequently asked to improvise and choreograph in collaboration with choreographers (e.g., Butterworth, 2004). At the same time, perfectionistic tendencies are common in dance (Nordin-Bates, Cumming, Aways, & Sharp, 2011). But to what extent are perfection and creativity compatible aims? How do teaching methods encourage or discourage them? The aim of this study was to examine these notions. To do so, students (N = 8) and staff (N = 5) from the Swedish Royal Ballet School were interviewed in depth. Interviews were semi-structured using a guide based in current literature and were digitally recorded and later transcribed verbatim. Analyses were conducted in NVivo and were primarily inductive in nature. Results revealed complex interrelationships between perfectionism and creativity, such that perfectionism sometimes nurtured, but more often thwarted, creativity. Antecedents of both perfectionism and creativity were found to be largely congruent with Basic Needs Theory (a sub-theory of Self-Determination Theory; Ryan & Deci, 2000). As such, creativity was perceived to be nurtured by several aspects of Autonomy Support (e.g., freedom within boundaries; valuing each individual), Competence Support (e.g., process focus; many ways of doing things right) and Relatedness Support (collaboration). Perfectionism, in contrast, was reported to be nurtured by Competence Thwarting (e.g., interpersonal comparisons; dichotomous attitudes) and undermined by Relatedness Support (e.g., building relationships). Additionally, creativity was perceived to be nurtured via Inspiration and Imagery while perfectionism was said to be nurtured indirectly via Perfectionistic Teachers. Findings will be discussed in light of Self-Determination Theory (Ryan & Deci, 2000), the Intrinsic Motivation Principle of Creativity (Amabile, 1983), and their potential implications for educators.

**The enhancement of student creativity in graphic design higher education – A
qualitative exploration of lecturer conceptions**

Lisa S. Sloan

University of Central Lancashire

There is no doubt that creativity holds great importance within Graphic Design, thus enhancing a student’s creative potential should be a fundamental focus throughout design education. This study uncovers current knowledge and experiences of creativity within design pedagogy, by analysing the occurrences in the field as presented by educators. With this reveal, theory can evolve and aim to answer how student creativity may be enhanced in graphic design higher education. It is highly likely that a lecturer’s ideologies will impact their students’ work process. Furthermore, by interviewing professional educators within the domain, this qualitative approach focuses on lecturers’ conceptions of the creative process, person, press and product (Rhodes, 1961). A comparable model is formed, with creativity research and design literature both with pedagogy focus, to cross analyse an area yet to be investigated with such focus. This study aims to highlight where current limitations may lie in education for theory to evolve and impact future curriculums. The enhancement of student creativity in graphic design higher education is of growing importance.

Creativity and innovation in the Government of Dubai: Exploring underlying factors at individual, team and organisational levels

Mark Batey, David Hughes, Immanuel Moonesar, and Fadi Salem

Alliance Manchester Business School and Mohammed Bin Rashid School of Government

How best to encourage creativity and innovation in individuals, teams, and the organisation is a long-running challenge. What advice there is, is often fragmented, with a weak empirical basis and lacking in subtlety and understanding of the culture of the organisation or the region (Walker & Batey, 2014). This presentation will report the findings of a mixed-methods study of creativity and innovation in the Government of Dubai that examined individual, team, organisational, and job factors as perceived by government employees (n = 979) in order to support the United Arab Emirates Innovation Strategy (2015). First, employees completed measures of Creative Self-Efficacy (Beghetto, 2006), Innovative Work Behavior (Scott & Bruce, 1994), Work Support (Batey & Hughes, 2018), Work Engagement (Seppälä, et al., 2009), Creativity and Innovation Culture (Walker, 2005) and Decision-Making Autonomy (Morgenson & Humphrey, 2006). These data were analysed for mean differences according to sex and hierarchy, before being incorporated into a structural equation model to explore the complex interrelationships between the measures. Second, the written responses of the employees to the question “What do you think could be done to encourage more creativity and innovation in your organisation?” were coded and analysed. The written response themes suggested the most important aspects to develop to encourage creativity and innovation were a supportive culture that values creativity and innovation. In addition, the themes of support in terms of Reward and Recognition, Risk-taking and Blame Culture, Openness to New Ideas, Empowerment, and Transparency and Trust also pointed towards the importance of developing a climate, environment, and workplaces that more explicitly embolden colleagues to have and share creative ideas and see them through to become innovations. These two analyses led to 25 interwoven policy recommendations in two broad categories: Culture and Leadership; and Supporting Practices.

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attendance, interest, and
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