

# Creativity: Are You Risky Enough?

Risk Type Compass

**pcl** opening  
minds

**risk**type  
**compass**®



## *The use of imagination or original ideas to create something; inventiveness – Oxford English Dictionary*

In the most popular Ted talk of all time, Sir Ken Robinson (2006) mounts a passionate criticism of the education system. He summarises his position as follows:

*“Being wrong is not the same as being creative, but if you’re not prepared to be wrong, you’ll never come up with anything original.”*

Robinson’s argument is that a creative endeavour will often involve some form of risk. Mistakes and errors are part of a creative process. But the development of creative behaviours is hampered by education’s tendency to stigmatise. Robinson concludes by calling for a system that seeks to encourage creativity.

This argument is not unique to the education system. Predicting the future is notoriously difficult, yet the rewards are great.

It’s thus unsurprising that employers seek creative people who can adapt to this uncertainty. This becomes clear when reading any list of desirable professional competencies. Be it ‘innovative’, ‘imaginative’ or ‘inventive’, the justification is clear. The ability to adapt and create is essential.

Yet as Sir Ken Robinson suggests, creativity involves an element of risk. Pursuing an original course of action can mean courting uncertainty and inviting failure. Be it crafting artwork to starting a new entrepreneurial venture. Engaging in creative endeavours opens the creator up to potential risk and reward.

We acknowledge the breadth and complexity of creativity yet predict risk to be an important component. Investigating the interaction between the two concepts will be the study’s primary focus.

### **Creativity**

Minimal consideration will reveal the concept of creativity to be broad and ambiguous. The Oxford English Dictionary’s definition above represents one

approach. Creativity concerns a tangible outcome perceived as innovative by an external knowledgeable commentator.

Others may be more inclined to regard creativity to be an antecedent to creation. Individuals possessing the inclination to innovate are often referred to as 'creative'. This may manifest as an aversion to the norm, or a desire to be different. These individuals can elicit a mixed response, from troublemaker to visionary. Yet in a climate of uncertainty, creativity is often a desirable commodity.

This leads us to psychology's interaction with creativity. What is it that differentiates between 'creative' and 'non-creative' individuals? A breakthrough came when researchers revealed five consistent personality factors.

Titled the 'Five Factor Model' (e.g. Barrick & Mount, 1991; Wiggins, 1996), these factors emerged through statistical analysis of the lexicon used to express personality-based individual differences. A-theoretical in nature, the model has been further validated using meta-analysis. The result is a workable framework for approaching the field of personality psychology.

The five factors are 'Agreeableness', 'Extraversion', 'Openness to Experience', 'Conscientiousness' and 'Neuroticism' (McCrae & John, 1992). Thousands of researchers have used them to understand a vast array of behaviours and outcomes over recent decades.

The most reported FFM interactions with creativity involve Openness to Experience and Extraversion (Furnham et al., 2013). Arnold et al. (2016) associates the former with the desire to work with ideas and possibilities, and the latter as the likelihood of being outgoing, gregarious, lively and sociable. Research into these factors using adult samples often report positive moderate relationships with creativity (e.g. Kandler et al., 2016, Furnham et al., 2013).

Weaker correlations with Neuroticism and Conscientiousness are also reported in several studies. Arnold et al. (2016) describes Neuroticism as associated with anxiety, self-doubt, and highly affected by emotions – especially in stressful situations, whilst Conscientiousness aligns with self-discipline, goal striving, orderliness, preference for order, and self-discipline.

Several studies report negative correlations between creativity and Neuroticism (e.g. Batey et al., 2010; Kandler et al., 2016; Karwowski et al., 2013). One interpretation is that an aversion to risk, caused by anxiety and doubt, could hamper creative endeavour.

Conscientiousness has reported significant relationships in both directions (e.g. Batey et al., 2010; Kandler et al., 2016). This suggests intra-factor conflict in the pursuit of creative endeavour. Conscientious individuals may benefit from elevated levels of industriousness and self-discipline. Yet a tendency for systematic deliberation may equally hamper creativity in such individuals.

The conclusion of these various findings is clear. Deeply-rooted dispositions account in part for creative tendencies and achievements. These range from identifying, considering and pursuing innovative and original ways of approaching a task, through to completing an end product or outcome.

### Risk Taking

There is potential for risk in almost everything that we do. Balancing opportunity and risk is key to success at every level of society. Yet even at the individual level, there are many difference factors in accounting for the readiness to take risk at a particular time. We acknowledge this unpredictability. Yet also recognise deeply-rooted propensities for risk have a consistent and pervasive influence.

The Five Factor Model (FFM) outlined above is one way to explore these propensities. The current study will use the Risk Type Compass (RTC) to pursue this. The RTC (Trickey, 2017) draws from risk-related FFM personality themes to understand differences in how individuals perceive, react to and manage risk. The result is an assessment that provides fascinating behavioural and decision-making insights through the lens of risk predisposition.

Factor analysis of many risk-relevant FFM subthemes identified 18 of note. These group into the four factors of 'Calm', 'Emotional', 'Daring' and 'Measured' that build the RTC. These four 'compass points' form two orthogonal bi-polar scales: the 'Emotional:Calm' and 'Daring:Measured' scales (see Figure 1. below).

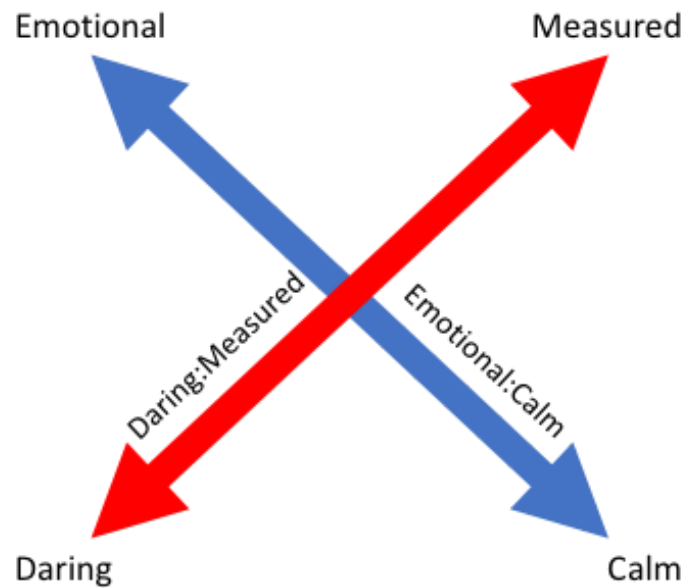


Figure 1. The four factors/two scales of the Risk Type Compass

Completing the Risk Type Compass will result in a score for both scales, each of which have profound behavioural implications. Scale-level analysis of twelve thousand participants show a weak correlation of 0.04. We view this independence as evidence of the two separate neurological systems involved in decision making hypothesised by Walport (2014).

Despite its risk focus, the RTC's derivation from the FFM facilitates comparisons. Ten of the subthemes comprise the 'Neuroticism-focussed' Emotional:Calm scale. The remaining eight subthemes reflect a mixture of FFM traits. Conscientiousness and Extraversion cover the bulk of these, with a hint of Openness to Experience.

Scores on both scales account for participants' assigned position on the compass and resulting Risk Type. There are over 200 potential compass positions (see Figure 2. below for 'mild Adventurous' example), each of which provide further narrative insight. The RTC provides a functional framework for differentiation of personality-based narrative descriptions.

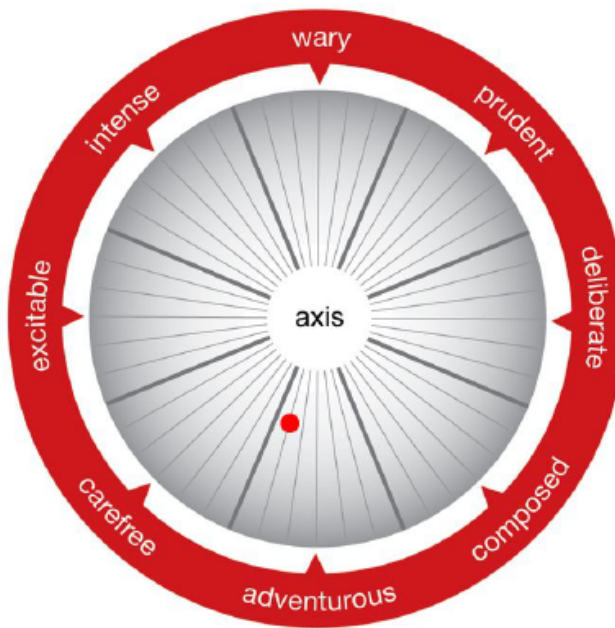


Figure 2. The Risk Type Compass

Analysis of our 12k sample indicates even Risk Type spread across the general population. Thus, when specific samples deviate from this symmetry, several narrative cues can emerge.

### Focus of the Research

Exploring the interaction between risk, personality and creativity is the overarching goal of the research. Adopting a risk-orientated focus on personality will inform the study's approach.

The research also benefits from the expertise of Professor Carolyn Mair PhD. Professor Mair pioneered the world's first 'Applied Psychology in Fashion' MSc at the University of the Arts London. Our collaboration provides the study with two further advantages:

1. Further insight into understanding creativity from a psychological perspective
2. Improved exposure to individuals employed in a range of creative industries

### Method

The current section will outline the approach we took to participant recruitment, in addition to the variables used to assess the concepts outlined above.



## Participants

Social media was our primary platform for participant recruitment. This was further enhanced by Professor Carolyn Mair's promotion across her numerous networks. We gave primary focus to individuals who considered themselves to be creative. Employment in 'creative fields' was also stated as desirable. Some efforts were also made to recruit 'non-creative' participants for sample diversity. Despite this, purposive sampling reflected our primary approach to participant recruitment.

## The Risk Type Compass

We assessed participants' personality and risk propensity using the Risk Type Compass (RTC). The RTC:

- Is a Registered Test with the British Psychological Society
- Has been audited against the European Federation of Psychologists' Associations (EFPA) review framework
- Uses a four-factor framework to categorise participants into one of nine categories (i.e. the eight Risk Types or Axial group)
- Takes approximately 10–15 minutes to complete and administered online

## Creativity

The conceptual complexity of creativity as a construct led to the adoption of two measures. The first was a measure of 'Self-Rated Creativity' (SRC) developed by Hughes, Furnham, and Batey (2013), which asked participants to score themselves (using a 10-point scale) on how creative they were (in comparison with other people) in the domains of 'Scientific', 'Social', 'Visual artistic', 'Verbal artistic' and 'Sports' creativity.

The research also used Carson, Peterson, and Higgins' (2005) 'Creative Achievement Questionnaire' (CAQ), which consists of two parts and also adopts a multi-domain approach. Part one asks participants to place a check mark next to the domain(s) they feel they have 'more talent, ability, or training than the average person'. Examples of the thirteen domains include 'Visual arts', 'Music', 'Creative writing', 'Inventions', and 'Scientific inquiry'.

Part two focusses on achievement by presenting eight statements reflecting increasing levels of achievement for each domain and asking participants to place a checkmark next to the sentences that apply to them. These sentences are domain-specific, but an example (using the 'visual

arts' domain) is presented below:

0. I have no training or recognized talent in this area. (Skip to Music).
1. I have taken lessons in this area.
2. People have commented on my talent in this area.
3. I have won a prize or prizes at a juried art show.
4. I have had a showing of my work in a gallery.
5. I have sold a piece of my work.
6. My work has been critiqued in local publications.
- 7\*. My work has been critiqued in national publications.

Responses are scored using the number next to the highest-ranked statement, with '\*' statements multiplied by the number of instances indicated by the participant.

We felt incorporating the SRC and CAQ provided the study with greater breadth in assessing creativity. Reliance on the former would make the data prone to personal misconceptions of creativity. Reliance on the latter may have given greater advantage to more 'established' participants.

### The Process

After providing informed consent, participants were given a weblink and access code that enabled them to take the Risk Type Compass online assessment. Participants were then automatically redirected to a second survey that included the 'Self-Rated Creativity' (SRC) and 'Creative Achievement Questionnaire' (CAQ). The process took approximately twenty minutes in total, and participants received a free Risk Type Compass 'Personal Report' for taking part.

### Findings

The method outlined above resulted in high quality in-depth data for all those who took part. The final size of the sample was 85. The average age was 38.96 (SD 11.55) and the sample was 65.88% female. The sample included artists, teachers, lecturers, creative directors, marketing/brand strategists, psychologists and designers.

Figure 3. below uses part one of the CAQ to give a summary of the creativity domains represented within the sample. Frequencies are based on responses to the prompt "Place a check mark beside the areas in which you feel you have more talent, ability, or training than the average person."



(participants could select as many domains as they wanted).

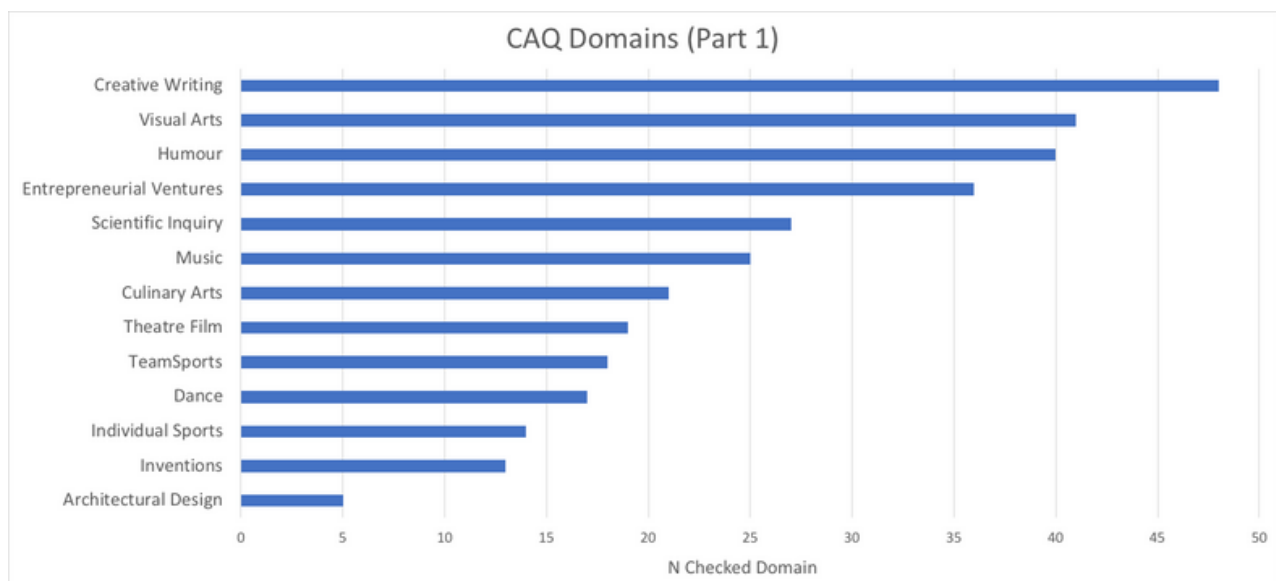


Figure 3. Frequency of creativity domains 'checked' by participants

The figure ranks the thirteen creativity domains from most to least prevalent based on the frequency checks. This figure provides a basic overview of the form and prevalence of creativity reflected below.

### Risk Type

Our initial analysis concerns the breakdown of Risk Types in our purposively-selected sample (n = 85). We can also compare this against our 'general population' sample of 11,900. The results of this comparison are presented in Figure 4. below.

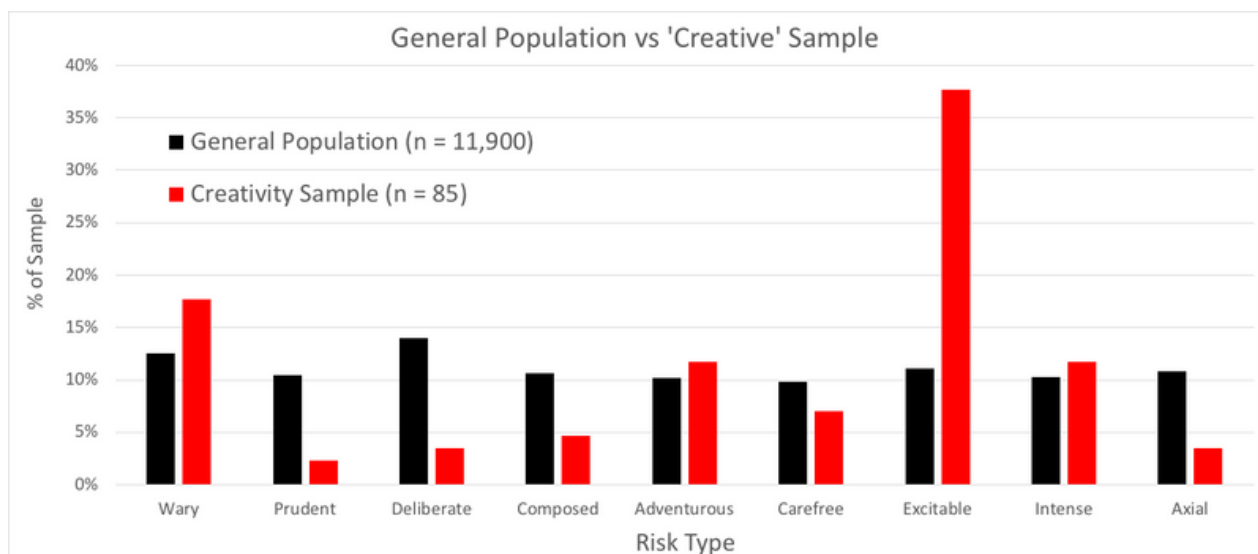


Figure 4. Risk Type breakdown of creativity and general population samples

The standout finding was the considerable over-representation of 'Excitable' Risk Types in our 'creative' sample. 38% of our participants resided in this part of the compass, compared to 11% of the general population. This Risk Type has proven elusive when looking to associate them with a specific group (i.e. industry, job role, interest, etc.). One potential explanation could be the prevalence of industries represented in our 'general population' sample. Several of the most frequently recurring job roles concern the reduction of risk (e.g. Health and Safety).

Excitable Risk Types reside in both the 'Emotional' and 'Daring' ends of the Emotional:Calm and Daring:Measured scales respectively. Trickey's (2017) description of the Risk Type is as follows:

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### Excitable Risk Type

At the root of this Risk Type is impulsivity and an attraction to risk combined with distress and regret if things go wrong. This Type tend to be passionate and vary in their moods between excited enthusiasm and pessimistic negativity. Such people are both frightened and excited by their impulsiveness and are likely to respond emotionally to events and react strongly to disappointment or the unexpected. Depending on the mood of the moment, they may enjoy the spontaneity of making unplanned decisions. Not being planful or well organised, there is a danger that such people may not take the trouble to check things out in their enthusiasm to embrace a new undertaking.

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The Risk Type distribution indicates a clear prevalence of Excitable Risk Types. However, further analysis to understand the Risk Type's interaction with creativity is required.

### Risk Type and the CAQ

Further analysis began by grouping participants by their CAQ (part two) scores, resulting in 'low' CAQ scorers (~45%) and 'high' CAQ scorers (~55%). Risk Types were also grouped into high Measured (Wary, Prudent and Deliberate) and high Daring (Excitable, Carefree and Adventurous). We excluded the remaining Risk Types (i.e. Intense, Axial and Deliberate) from this figure.

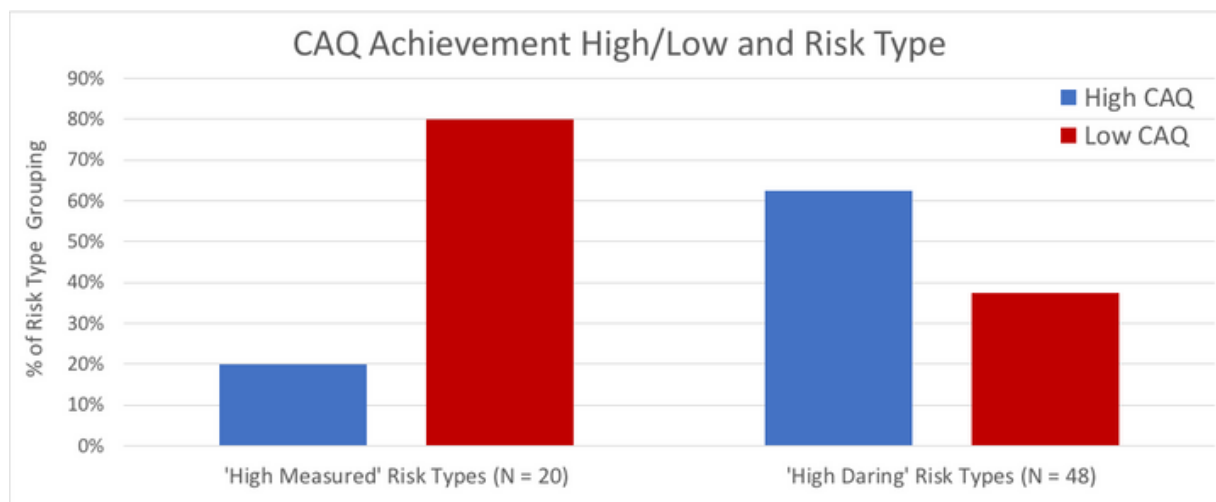


Figure 5. Proportion of Risk Type group in high/low CAQ group

Findings indicated that high Daring Risk Types were more likely to report higher levels of creative achievement. A statistically significant (to the  $<0.01$  level) negative correlation of  $-.313$  between the CAQ and Daring:Measured scale drives this finding. One explanation is that individuals whose disposition makes them more tolerant to risk are more likely to engage in creative endeavours to the point of completion and goal attainment.

So far, analysis of the RTC has concerned Risk Type. However, subtheme-level analysis can provide greater nuance to our understanding.

### RTC Subthemes and Self-Rated Creativity

Risk Type derives from the two scale scores, which in turn generate from scores across 18 distinct 4-item subthemes. Analysis at this level represents considerable insight, but the small number of items means caution should be urged.

We began by correlating subtheme scores with SRC domain scores. Table 1. below presents the findings, with statistically significant correlations highlighted in yellow.

Table 1. Correlations between RTC subthemes and SRC scores

RTC		Self-Rated Creativity Domain					SRC Total
Scale	Subtheme	Scientific	Social	Visual arts	Verbal arts	Sports	
Emotional Calm	Apprehensive	-0.2	-0.203	-0.014	0.039	-0.142	-.250 <sup>*</sup>
	Equable	.236 <sup>*</sup>	0.045	-.241 <sup>*</sup>	-0.195	0.149	0.005
	Confident	0.137	.381 <sup>**</sup>	-0.051	0.021	-0.003	.219 <sup>*</sup>
	Intuitive	-.243 <sup>*</sup>	.216 <sup>*</sup>	.308 <sup>**</sup>	.399 <sup>**</sup>	-.224 <sup>*</sup>	0.196
	Forgiving	0.11	0.187	-0.032	.238 <sup>*</sup>	0.003	.232 <sup>*</sup>
	Optimistic	-0.017	0.096	0.138	0.101	-0.062	0.117
	Eager	0.165	-0.047	-0.148	-0.108	0.011	-0.054
	Resilient	-0.094	.351 <sup>**</sup>	-0.016	0.078	-0.008	0.13
	Sensitive	-.334 <sup>**</sup>	-0.035	.308 <sup>**</sup>	0.209	-0.193	-0.032
	Astute	-0.03	-0.184	.219 <sup>*</sup>	0.01	-0.046	-0.006
Daring:Measured	Audacious	0.031	.327 <sup>**</sup>	0.089	0.189	0.099	.338 <sup>**</sup>
	Conforming	-0.06	-0.077	-0.052	-.220 <sup>*</sup>	0.179	-0.102
	Explorative	0.185	0.019	-0.051	-0.052	.387 <sup>**</sup>	.245 <sup>*</sup>
	Focused	0.138	0.21	0.1	-0.044	0.019	0.2
	Methodical	-0.147	0.208	0.175	-0.06	-0.098	0.027
	Perfectionistic	-0.161	0.157	.271 <sup>*</sup>	-0.022	-0.176	0.024
	Hasty	0.189	0.113	-0.078	0.009	.266 <sup>*</sup>	.242 <sup>*</sup>
	Spontaneous	0.083	.454 <sup>**</sup>	-0.002	.215 <sup>*</sup>	0.007	.342 <sup>**</sup>

The highlighted cells above show a range of relationships between RTC subthemes and SRC domains. It is notable that 'Scientific' and (to a lesser extent) 'Sports' creativity have several opposing subtheme relationships with 'Visual Arts' and 'Verbal Arts'. Standout examples include 'Equable', 'Sensitive' and 'Intuitive'.

Social Creativity appeared to be a little more independent to other SRC domains. Correlations with the subthemes of Spontaneous (.454), Confident (.381), Resilient (.351), Audacious (.327) and Intuitive (.216) emerged in our analysis.

These findings suggest that individuals scoring highly on these subthemes perceive themselves to be more creative when interacting with friends and family, managing people and solving personal problems.

The most influential RTC subtheme was Intuitive, which is defined as follows:

**Intuitive** – Distinguishes those that base decisions on facts and logic, rather than feelings, from those that seem easily influenced by their emotions.

This subtheme reflected different and contrasting relationships depending upon the domain of creativity. Higher scores were positively associated with the 'Social', 'Visual Arts' and 'Verbal Arts' domains. In contrast, 'Scientific' and 'Sports' domains were associated with lower scores.

Decision making style is one approach to interpreting these scores. Passionate emotionality could be better suited to 'artistic' creativity. Yet in the realms of science and sport, dispassionate calmness appears more appropriate.

A combined score was also generated from summing the five creativity domains together. This provides a broad overview at the cost of nuance. The most notable correlations were Spontaneous (.342), Audacious (.338) and Apprehensive (-.250). This suggests that 'general' creativity is more prevalent in individuals who are less anxious and more proactive.

### RTC Subthemes and CAQ Creativity

Correlational analyses were also conducted between the RTC subthemes and the CAQ domains of creativity. In contrast with the SRC outlined above, the CAQ (part 2) requires respondents to indicate quantifiable achievements in creativity domains, although strong correlations between comparable domains in both measures were indicated. It should also be noted that some domain-based cross overs were apparent (e.g. Visual Arts), but like-for-like comparisons were not always achievable. The output in Table 2. below presents the most relevant CAQ domains and their relationships with the RTC subthemes.

Table 2. Correlations between RTC subthemes and CAQ (part 2) scores

RTC		CAQ Domain				CAQ Total
Scale	Subtheme	Visual Arts	Creative Writing	Inventions	Scientific Discovery	
Emotional Calm	Apprehensive	-0.067	-0.045	-0.178	-0.06	-0.146
	Equable	-0.154	-0.068	0.152	.251*	0.07
	Confident	0.065	-0.021	0.082	0.044	0.058
	Intuitive	.246*	.419**	-0.067	-0.152	0.188
	Forgiving	0.127	.275*	.307**	-0.003	.288**
	Optimistic	.234*	0.117	0.046	-0.035	0.189
	Eager	-0.079	-0.194	0.054	0.021	-0.159
	Resilient	0.005	0.146	-0.019	-0.113	0.087
	Sensitive	0.13	0.095	-0.201	-0.112	0.021
	Astute	-0.054	-0.037	-0.064	-0.022	-0.04
Daring:Measured	Audacious	.233*	.298**	0.2	0.1	.348**
	Conforming	-0.132	-.254*	-.258*	-0.15	-.335**
	Explorative	0.15	-0.033	0.132	-0.114	0.075
	Focused	0.156	-0.021	0.152	0.046	0.086
	Methodical	0.008	-0.187	-0.005	0.084	-0.031
	Perfectionistic	0.102	-.232*	0.003	-0.1	-0.131
	Hasty	.233*	0.11	0.07	-0.094	0.128
	Spontaneous	0.176	0.126	0.013	-0.107	0.077

Analyses indicated several replicated patterns of correlations between the SRC and CAQ. Notable examples included 'Equable' (Scientific Discovery), 'Conforming' (Creative Writing) and 'Intuitive' (Visual Arts and Creative Writing).

In contrast to the SRC, analysis shows the Audacious subtheme to have the strongest relationships. The most significant correlations were with the domains of Visual Arts (.233) and Creative Writing (.298).

Perfectionistic (-.232) emerged as a potential detractor to Creative Writing, whilst the subthemes of Optimistic (.234) and Hasty (.233) displayed a positive relationship with Visual Arts.

As with the SRC, findings suggest that individuals possessing a proactive mindset were more likely to engage in, and achieve, their creative artistic goals.



The CAQ domain of 'Inventions' was also notable, with significant relationships with 'Forgiving' (.307) and 'Conforming' (-.258). The RTC technical manual describes these as follows:

**Forgiving** – Distinguishes those that are likely to quickly get over upsets and who don't harbour grudges from those that may be resentful and find it hard to put the past behind them.

**Conforming**– Distinguishes those that respect rules, regulations and authority from those that are happy to bend the rules and may not feel the need to comply.

Several potential interpretations emerge from correlations with the inventions CAQ domain. Overcoming setbacks (high forgiving) and avoiding 'established' thinking (low conforming) appeared to aid achievement in this domain. The correlation between 'forgiving' and creative writing also indicates the benefit of overcoming setbacks in this field of creativity.

As with the SRC, all CAQ domains were summed to create a 'CAQ Total'. This generated significant correlations with Audacious (.348), Conforming (-.335) and Forgiving (.288). Interpretations of these relationships appear to align with those of the 'Inventions' domain above.

## Discussion

The multi-faceted approach to understanding creativity adopted by the research proved invaluable. Utilising a 'domain approach' enabled nuance to emerge between the contrasting forms of creativity. This challenges homogeneous approaches to creativity, although the existence of multifaceted creativity variables suggests this would not surprise researchers.

Individuals reporting creativity in one domain were not always creative in other domains. In some instances, analysis indicated negative inter-domain relationships (e.g. between 'Scientific' and 'Visual Arts').

This represents an obstacle for researchers. Contrasting and conflicting components encompassed by an already ambiguous concept will act to hamper analyses that approach creativity as a singular construct.

The current research attempted to address this in two ways. The first was to consider creativity at domain level. The second was to adopt a risk-focussed framework that accounted for intra-personality interaction. It is worth noting that previous research often overlooks the latter, as creativity researchers using personality measures typically assess each of the five factors separately. Our research indicates that using inter-factor interactions to account for creativity is a clear and potentially fruitful avenue of research. The Risk Type approach we adopted achieved this to some degree. This resulted in the most notable finding of our analysis: the over-representation of Excitable Risk Types.

Our composite breakdown of personality also proved fruitful, as RTC subthemes provided additional insight beyond Risk Type. This is also a recurring limitation of previous research into personality and creativity, as minimal consideration is often given to intra-factor analysis despite the fact that each factor encompasses a degree of nuance and variety. As with Risk Type, our use of RTC subthemes also revealed interactions with creativity that would otherwise have remained hidden, and this insight is increased further when considering the intersection of subthemes with risk domains.

One example of this insight involves the Intuitive subtheme, which reported positive relationships with 'artistic' creativity domains, but negative relationships with 'scientific' creativity domains. The former may reflect an advantage for going with your 'gut feeling' to instigate and complete creative goals. The latter implies there are greater benefits to adopting a more logical and systematic approach in scientific fields.

*It is the tension between creativity and scepticism that has produced the stunning and unexpected findings of science*

- Carl Sagan

Some of the recurring aspects of personality that emerged across domains related explicitly to risk taking. Excitable Risk Types were three times more likely to reside in the sample compared against the general population. The influence of risk tolerance emerged further at subtheme level. The subthemes of 'Audacious', 'Spontaneous', 'Conforming' (-), 'Explorative' and 'Hasty' generated statistically significant relationships across multiple domains.

Before stating our final conclusions, it is worth noting a couple of difficulties. The first is to note the breadth and ambiguity of creativity as a concept. This makes clear, consistent and high-strength relationships harder to establish for researchers.

The second is that our approach to personality gives little emphasis to the 'Openness to Experience' factor. This is regarded as the most influential aspect of personality in predicting creativity.

### Conclusion

The current study set out to explore the potential interaction, if any, between risk and creativity. By adopting an innovative approach to assessing the former and nuanced view of conceptualising the latter, we are able to report findings that appear to affirm the existence of an interaction.

Caveats do exist, with the most apparent being the requirement to define and reflect upon the different forms that creativity can take. But as Sir Ken Robinson argued, a propensity to take a risk appears to be a key component creating something original.

*An essential aspect of creativity is not being afraid to fail*

– Dr. Edwin Land

## About the Authors

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Simon is a Consultant Psychologist with Psychological Consultancy Ltd, where he is involved in numerous Research & Development projects in the field of personality assessments. He is a Chartered Psychologist (CPsychol) and Associate Fellow (AFBPsS) with the British Psychological Society, a Chartered Scientist (CSci) with the Science Council, and an International Affiliate with the Society for Industrial and Organizational Psychology (SIOP).

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### Professor Carolyn Mair

Carolyn Mair is a behavioural consultant with psychology.fashion, a consultancy she established in 2017. She is a Chartered Fellow of the British Psychological Society and holder of their Distinguished Contributions to Psychology Education Award. Carolyn has published broadly in academic, business and media publications. Her book, *The Psychology of Fashion*, was one of Routledge's top selling Psychology books in 2018. Carolyn holds a PhD in Cognitive Neuroscience, MSc Research Methods and BSc(Hons) Applied Psychology and Computing.

## References

- Barrick, M. R., & Mount, M. K. (1991). The Big Five personality dimensions and job performance: A meta analysis. *Personnel Psychology*, 44, 1-26
- Batey, M. (2012). The measurement of creativity: From definitional consensus to the introduction of a new heuristic framework. *Creativity Research Journal*, 24, 55-65
- Batey, M., Chamorro-Premuzic, T., & Furnham, A. (2010). Individual differences in ideational behavior: can the big five and psychometric intelligence predict creativity scores? *Creativity Research Journal*, 22(1), 90-97
- Batey, M. & Furnham, A. (2006). Creativity, intelligence and personality: A critical review of the scattered literature. *Genetic, Social, and General Psychology Monographs*, 132, 355- 429
- Carson, S. H., Peterson, J. B., & Higgins, D. M., (2005). Reliability, Validity, and Factor Structure of the Creative Achievement Questionnaire. *Creativity Research Journal* 17(1), 37-50
- Furnham, A., Hughes, D. J., & Marshall, E. (2013). Creativity, OCD, Narcissism and the Big Five. *Thinking Skills and Creativity*, 10, 91-98
- Hughes, D. H., Furnham, A., & Batey, M. D. (2013). The structure and personality predictors of self-rated creativity. *Thinking Skills and Creativity*, 9, 76-84.
- Kandler, C., Riemann, R., Angleitner, A., Spinath, F. M., Borkenau, P., & Penke, L. (2016). The nature of creativity: The roles of genetic factors, personality traits, cognitive abilities, and environmental sources. *Journal of Personality and Social Psychology*, 111(2), 230-249
- Karwowski, M., Lebuda, I., Wisniewska, E., & Gralewski, J. (2013). Big Five Personality Traits as the Predictors of Creative Self-Efficacy and Creative Personal Identity: Does Gender Matter? *The Journal of Creative Behavior*, 47(3), 215-232

McCrae, R. R., & John, O. P. (1992). An Introduction to the 5-Factor Model and its applications. *Journal of Personality*, 60(2), 175–215

Robinson, K. (2006). Do Schools Kill Creativity? TED: Ideas Worth Spreading, Retrieved August 13, 2018, from [www.ted.com/talks/ken\\_robinson\\_says\\_schools\\_kill\\_creativity](http://www.ted.com/talks/ken_robinson_says_schools_kill_creativity)

Trickey, G. (2017). Risk Type Compass: Technical Manual (4th Ed.) Psychological Consultancy Ltd: Tunbridge Wells, Kent

Walport, M. (2014). Innovation: Managing Risk, Not Avoiding It. Government Chief Scientific Adviser Annual Report, The Government Office for Science, London. Retrieved July 12, 2018, from [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/381905/14-1190a-innovation-managing-risk-report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/381905/14-1190a-innovation-managing-risk-report.pdf)

Wiggins, J. S. (1996). The Five Factor Model of Personality, Theoretical Perspectives (Ed.). New York: The Guilford Press