

# Cognadev Technical Report Series

4

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## Values Orientations (VO), MBTI Personality scores & types, Belbin ranked Team Types, and Cognadev's CPP attributes.

Analysing and reporting upon the relationships between VO selected and rejected values orientations, MBTI personality scores & types, Belbin ranked team types, and CPP attribute-scores, levels of work, and ranked cognitive styles.

**cognadev**

18B Balmoral Ave  
Hurlingham  
Sandton 2196  
Johannesburg  
South Africa

Tel: +27 11 884-0878  
Fax: +27 11 884-0910

Paul Barrett: Chief Research Scientist  
Ania Stephens: Psychologist  
Saasha Singh: Psychologist

[www.cognadev.com](http://www.cognadev.com)

[paul@cognadev.com](mailto:paul@cognadev.com)

## Executive Summary

Using two samples of data (n=441 and 202) comprised of incumbent international employee data, investigating the relationships between selected accepted and rejected values orientations and scores/ranks/types on the MBTI, Belbin Team Role, and the Cognadev CPP, the following results were observed:

### MBTI

- Significant findings were observed in both MBTI preference clusters and individual preferences. Cluster NT seems mostly associated with Orange and Red value orientations, while cluster ST appears to be linked with Blue value orientation. Further, NT's tend to reject Purple orientation and ST's reject mostly Turquoise orientation.
- Green and Purple value orientations in general were observed to have few monotonic relationships to the MBTI preferences, while Blue, Orange and Red value orientations showed strongest monotonic relationship with the MBTI preferences.
- Acceptance of Blue value orientation appeared to be linked to Extraversion, Thinking and Judging MBTI preferences.
- Acceptance of Red value orientation showed a monotonic relationship to Extraversion, Sensing and Thinking.
- Acceptance of Orange value orientation showed association with Extraversion and Thinking.
- Intuition MBTI preference seemed linked to Yellow and Green value orientations, while Purple orientation was associated with Sensing.

### Belbin

- The homogeneous sample presents a vast majority of Shaper role preferences, followed by the Co-ordinator role and then the Implementer role. However, across all 8 team roles, the predominating values are consistently a combination of the Red, Blue and Orange worldviews.
- Both the Shaper and Coordinator roles are considered to be leadership roles which differ in terms of their focus. Shapers do not tolerate complacency whereas Coordinators lead by recognising strengths in individuals and delegating tasks accordingly. Both Shaper and Implementer roles are the *action-oriented* roles, thus corresponding to the predominantly results-driven Red-Blue-Orange combination.
- The less common Yellow and Green values seemed to correlate with a few roles such as Coordinator (for the tolerant, big-picture systems-thinking perspective); as well as the Plant role for their authenticity, originality and belief in freedom of choice.
- The group-oriented Purple and Green values correlated with the Team Worker as a *primary* role, which highlights the similarities regarding the value of teamwork over individual recognition and the desire for harmony within the team. However elevated Yellow and Orange values were depicted when the Team Worker was selected as a tertiary role, suggesting that such individuals adopt a more social attitude in order to boost primary drives of achievement and self-actualisation.
- The Turquoise value system was consistently rejected across the sample, probably due to its transcendent, cosmic and non-materialistic approach.
- A rejection of Yellow values was also quite prevalent, particularly among those who selected the Team Worker as the primary role. Those with Yellow values could be perceived as selfish in their pursuit of meaning and autonomy.

### CPP

- It was noted that the reason for the homogeneity of CPP scores and ranks across values is because the respondents within the samples are themselves homogenous with respect to job role, training and qualification, and managerial/leadership level within that role.

- The greatest presence of all VO colours is evident at the Diagnostic Accumulation (2) Level of Work (LoW). Although this environment is technical/knowledge-driven in nature, it can encompass different types of work (from task-oriented analyst to people-oriented psychologist) which would incite the existence of a variety of worldviews. Tactical Strategy (3) LoW seems to be more associated with Red, Orange and Green orientations, as such an environment is related to direct management and action-orientation. Lastly, Parallel Processing (4) LoW is mainly Yellow on VO as the focus is more on broad strategy and abstract and dynamic elements.
- The data shows that although value orientation can influence one's current comfort with complexity (current Level of Work), it doesn't limit one's potential to deal with greater complexity.
- The Analytical style as a primary or secondary style seemed to correlate with the individualistic Red, Orange and Yellow values. Individuals with these values are not likely to accept information at face-value or tolerate "group-think", hence the rigorous fact-based approach. Green values showed some differentiation too, perhaps because of the theoretical inclination and desire for deeper understanding.
- No clear differentiation was observed among those with the Holistic style preference, however slight elevations in Yellow values hints at the shared approach of viewing the whole as greater than the sum of its parts.
- The magical thinking associated with the Purple value system seems to account for the rejection of Purple values by those with the Analytical style

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# 1. Sample Details

## 1.1 Sample 1

A total sample of 441 heterogeneous-nationality incumbent employees is comprised 388 internationals working for a large international corporate, and 53 South Africans working within South Africa for two smaller organizations. The incumbent job-roles span across senior management and C-suite executive roles, within industrial-production, infrastructure and security job-sectors. All the employees are graduates, including many with postgraduate qualifications. Not all employees completed all the assessments.

Gender, ethnicity, and age (at assessment completion) information was made available to us by the two smaller organizations (n = 53) contributing to the assessment data; subsequently we can only report on these summary demographics for a small subset of cases. Informal estimates of the gender balance in the larger sample is 95% males, 5% females.

Table 1: Gender frequencies for a subset of the data (*sample 1*)

Category	Frequency table: gender (Multisource CPP, VO, Belbin, MBTI- 22-Oct-14.sta)			
	Count	Cumulative Count	Percent	Cumulative Percent
Female	11	11	20.75	20.75
Male	42	53	79.25	100.00

Table 2: Ethnicity frequencies for a subset of the data (*sample 1*)

Category	Frequency table: ethnic (Multisource CPP, VO, Belbin, MBTI- 22-Oct-14.sta)			
	Count	Cumulative Count	Percent	Cumulative Percent
African	14	14	26.42	26.42
Asian	8	22	15.09	41.51
Caucasian	18	40	33.96	75.47
Other	13	53	24.53	100.00

Table 3: Summary descriptive statistics for Age at testing, for a subset of the data (*sample 1*)

Variable	Descriptive Statistics (Multisource CPP, VO, Belbin, MBTI- 22-Oct-14.sta)					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
Age at testing	53	38.5	39	23	52	6.95

## 1.2 Sample 2

A total of 202 cases of incumbent employee data were sampled from three international organizations across the UK, Europe, North and South America, Malaysia, Indonesia, and South Africa. The incumbent job-roles span senior management and C-suite executive roles, within industrial-production, pharmaceuticals, infrastructure, and security job-sectors. All the employees are graduates, including many with postgraduate qualifications. This sample provided data for the VO x CPP attribute analyses, augmenting the analyses using Sample 1's data.

Table 4: Gender frequencies (*sample 2*)

Category	Frequency table: Gender - Sample 2			
	Count	Cumulative Count	Percent	Cumulative Percent
M	176	176	86.70	86.70
F	27	203	13.30	100.00



Table 5: Ethnicity frequencies for a subset of the data (*sample 2*)

Category	Frequency table: Ethnicity - Sample 2 subset			
	Count	Cumulative Count	Percent	Cumulative Percent
Black African	22	22	24.72	24.72
WhiteEuropean	52	74	58.43	83.15
Indian	12	86	13.48	96.63
Other	2	88	2.25	98.88
Coloured	1	89	1.12	100.00

Table 6: Summary descriptive statistics for Age at testing (*sample 2*)

Variable	Descriptive Statistics - Sample 2					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
Age at Testing	182	45.2	46	26	61	7.77

## 2. Selected Values Orientations, MBTI scores and types

For the MBTI, both scale scores and type data existed for each incumbent. The purpose of the following analyses is to explore the relationships between the selected accepted/rejected values orientations and the MBTI attributes and types. Data for these analyses were drawn from Sample 1.

Myers-Briggs Type Indicator (MBTI) is an indicator of personality preferences in terms of four dichotomies. Individuals tend to use both sides of each pair, however one is generally a natural preference. These are as follows:

- Where one focuses their attention and gets energy: Extraversion or Introversion
- The kind of information one likes and trusts: Sensing or Intuition
- The way one makes decisions: Thinking or Feeling
- One's attitude toward the external world: Judging or Perceiving

When combined, these preferences indicate a specific personality type. The combinations make up 16 distinct personality types.

### 2.1 Correspondence Analyses

An initial structural analysis was undertaken graphically displaying the relationship between VO orientations and MBTI types, using "Correspondence Analysis" (CA: Greenacre, 1984<sup>1</sup>; Benzécri, 1992<sup>2</sup>). This methodology is suited to the analysis of category relations, especially the display of similarity between frequencies of two sets of variable categories (here the seven VO orientations and MBTI types).

CA is primarily an exploratory data-analysis/exposition technique designed to investigate two-way and multi-way tables for the degree of structural correspondence between the attribute-frequencies comprising the rows and columns of the tables. The results provide a graphical output of the tabled category relations which is most similar to that found in non-metric multidimensional scaling and principal coordinate bi-plot analyses. Attributes plotted closer to one another in the 2-dimensional space share more similar frequency co-occurrence.

<sup>1</sup> Benzécri, J. P. (1992). *Correspondence analysis handbook*. New York: Marcel Dekker.

<sup>2</sup> Greenacre, M. (1983). *Theory and Applications of Correspondence Analysis*. London: Academic Press.

### 2.1.1 Selected Accepted Orientations

The data table constructed for all selected and accepted orientations data is provided in Table 7 below, with the actual table submitted for analysis presented in Table 8 (I've excluded all table cells with < 10 frequencies per cell). Because up to *three* orientation colours may be classed as "selected" for an individual, there are more observations (frequencies) than cases in these tables; each table incorporates all observed orientation frequencies associated with each MBTI type.

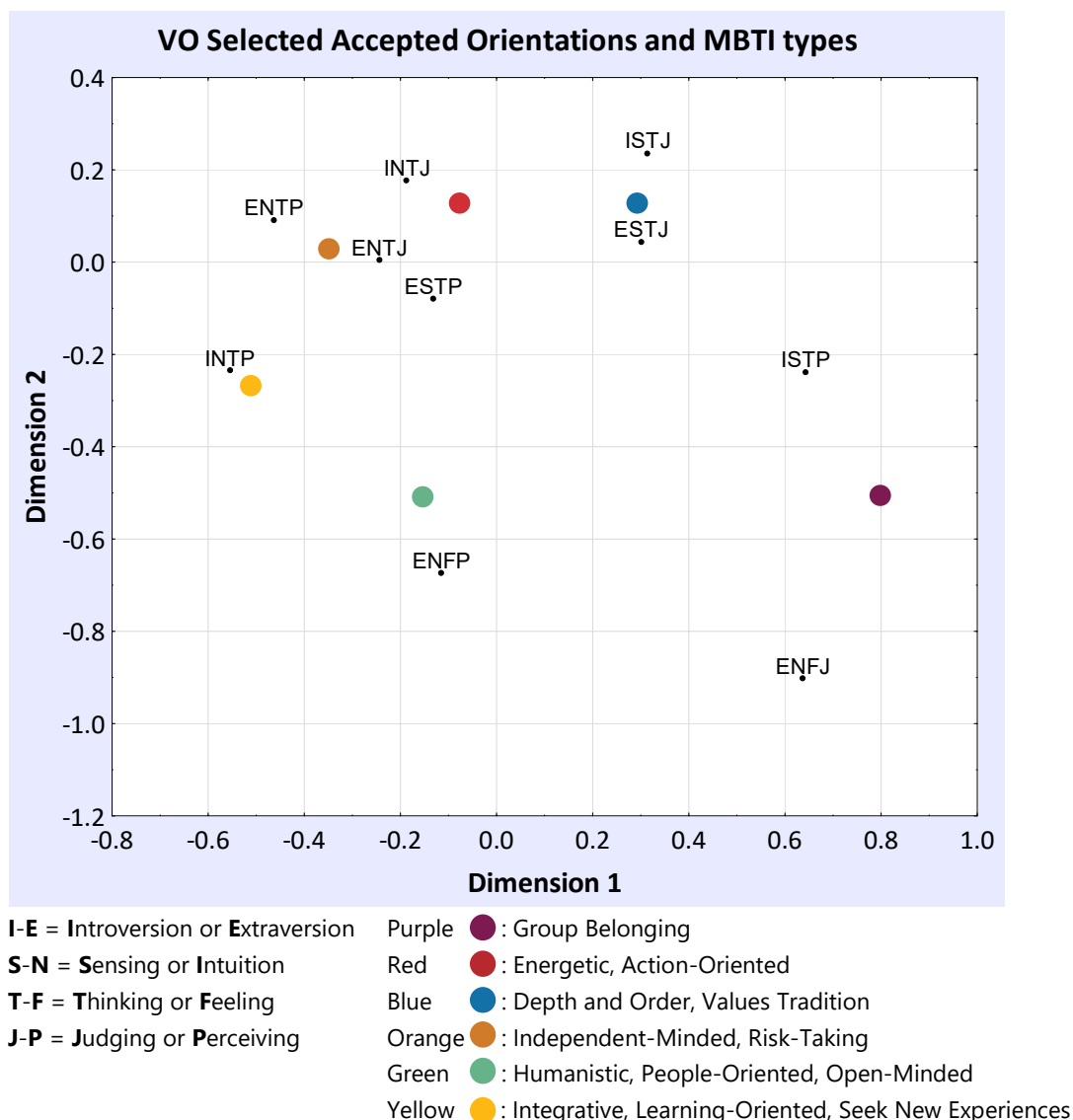
Table 7: The complete frequency table for VO selected accepted VO orientations and MBTI types

Observed Table (Frequencies) (Accepted Selected (3) VO x MBTI Type - for Correspondence Analysis.sta)								
Row variables: MBTI Type(24)								
Column variables: Orientation(7)								
	Purple	Red	Blue	Orange	Green	Yellow	Turquoise	Total
ESTP	1	6	5	4	2	2	0	20
ENTJ	2	30	27	29	11	9	1	109
ESTJ	12	26	52	17	4	8	0	119
ENTP	0	10	7	10	1	6	0	34
ISTP	3	4	5	1	1	0	0	14
INTP	1	6	5	10	2	8	0	32
INTJ	0	10	13	12	3	2	0	40
ENFJ	3	0	4	1	2	1	0	11
ISTJ	4	16	29	9	2	1	1	62
ESTJ/P	0	4	3	2	0	0	0	9
ISFP	0	0	1	0	1	0	0	2
INT/FJ	0	0	0	0	1	0	0	1
ESFJ	0	1	1	0	1	0	0	3
ENTJ/P	0	0	1	2	1	1	0	5
ENFJ/P	0	0	0	0	1	0	1	2
INFP	1	1	0	1	2	0	0	5
ENFP	1	2	2	2	3	1	0	11
IS/NTJ	0	1	1	0	0	0	0	2
ESFP	1	0	1	0	0	0	0	2
ISFJ	0	0	1	0	0	0	0	1
INFJ	1	0	1	1	1	0	0	4
ES/NTJ/P	1	0	1	0	0	0	0	2
INT/FP	0	0	1	0	0	0	0	1
ENT/FJ/P	0	0	0	1	0	0	0	1
Total	31	117	161	102	39	39	3	492

Table 8: The subset frequency table for VO selected accepted VO orientations and MBTI types (all marginals > 10)

Observed Table (Frequencies) (Accepted Selected (3) VO x MBTI Type - for Correspondence Analysis.sta)							
Row variables: MBTI Type(10)							
Column variables: Orientation(6)							
	Purple	Red	Blue	Orange	Green	Yellow	Total
ENTJ	2	30	27	29	11	9	108
ESTJ	12	26	52	17	4	8	119
ENTP	0	10	7	10	1	6	34
ISTP	3	4	5	1	1	0	14
INTP	1	6	5	10	2	8	32
INTJ	0	10	13	12	3	2	40
ENFJ	3	0	4	1	2	1	11
ISTJ	4	16	29	9	2	1	61
ENFP	1	2	2	2	3	1	11
Total	27	110	149	95	31	38	450

Figure 1: The 2-dimensional CA of VO selected accepted orientations and MBTI types



In Tables 6 and 7 below,

- the **Quality** column contains information concerning the quality of representation of the respective column and row point in the coordinate system defined by the respective numbers of dimensions. Computationally, the goal of the correspondence analysis is to reproduce the distances between points in a low-dimensional space. If we extracted (i.e. interpreted) the maximum number of dimensions (which is equal to the minimum of the number of rows and the number of columns, minus 1), you could reconstruct all distances exactly. The quality of a point is defined as the ratio of the squared distance of the point from the origin in the chosen number of dimensions, over the squared distance from the origin in the space defined by the maximum number of dimensions. By analogy to Factor Analysis, the quality of a point is similar in its interpretation to the communality for a variable in factor analysis.
- The **Cosine<sup>2</sup>** column provides the 'quality' for each attribute category (point), by dimension. This value may be interpreted as the "correlation" of the respective point with the respective dimension. The term Cosine<sup>2</sup> refers to the fact that this value is also the squared cosine value of the angle the point makes with the respective dimension.

Table 9: Correspondence Analysis solution indices for MBTI types

Row Name	Input Table (Rows x Columns): 10 x 6 Standardization: Row and column profiles			
	Row Number	Quality	Cosine <sup>2</sup> Dim.1	Cosine <sup>2</sup> Dim.2
ESTP	1	0.46	0.33	0.13
ENTJ	2	0.70	0.70	0.00
ESTJ	3	0.86	0.84	0.02
ENTP	4	0.81	0.78	0.03
ISTP	5	0.81	0.71	0.10
INTP	6	0.74	0.62	0.11
INTJ	7	0.59	0.31	0.28
ENFJ	8	0.97	0.32	0.65
ISTJ	9	0.98	0.63	0.35
ENFP	10	0.66	0.02	0.64

Table 10: Correspondence Analysis solution indices for the VO selected accepted orientations

Column Name	Input Table (Rows x Columns): 10 x 6 Standardization: Row and column profiles			
	Column Number	Quality	Cosine <sup>2</sup> Dim.1	Cosine <sup>2</sup> Dim.2
Purple	1	0.95	0.69	0.26
Red	2	0.56	0.12	0.45
Blue	3	0.95	0.79	0.16
Orange	4	0.94	0.93	0.01
Green	5	0.58	0.05	0.52
Yellow	6	0.66	0.54	0.13

When considering specific clusters within MBTI assessment in relationship to VO perceptual framework acceptance, it can be inferred that NT combination is mostly associated with Orange and Red value orientations. Additionally it is remotely associated with Yellow framework. This is likely due to the independent, realistic, technical but conceptual approach to ideas, information and people. ST combination seems to be mostly associated with Blue value orientation suggesting a focus on tangible, practical and ordered information. NF profile seems to be in closer relationship to the collectivistic value orientations – Green and Purple – indicating their warm and accommodating orientation.

ENTP is most closely associated with Orange value orientation. Individuals who accept Orange orientation and present ENTP profile tend to show high levels of energy in terms of seeking out new possibilities and challenges. Creation of ideas and generation of new solutions to difficult problems are likely to be stimulating to them. Perceptions are important to them hence they are likely to be perceptive of other people's attitudes and even use these perceptions to get buy-ins from others.

ENTJ is associated with both Orange and Red value orientations. Individuals with such a combination are likely to show high levels of drive and energy for complex problems and achievement of goals and results. They may appear impatient when it comes to other people's complacency and could come to decisions prematurely, without sufficient consideration of detail.

INTJ and ESTP are mostly associated with Red value orientation with possible elements of Orange value orientation. Individuals with such a combination of results can appear single-minded in terms of their attention to goals. They could appear action-oriented, realistic, critical and having high expectations of performance.

The essence of the relationship between ESTJ, ISTJ profiles and Blue value orientations seems to be a matter-of-fact, reliable and dutiful approach. These individuals tend to value procedures in place and will most likely appear thorough, hard-working and practical when dealing with problems or people.

INTP profile is mostly associated with Yellow value orientation. Individuals presenting with such a profile tend to be intrinsically interested in theoretical and intellectual problems. At times they may appear withdrawn or quiet, however they present intellectual curiosity and are likely to become energetic when dealing with a topic which interests them.

ENFP profile seems to be associated with Green value orientation. Such a combination is marked by relativism as individuals tend to see different perspectives and at times find it hard to decide on one point. They show concern for people and desire to understand and accommodate others.

### 2.1.2 Selected Rejected Orientations

For these orientations, the data table constructed for all selected and rejected orientations data is provided in Table 11, with the actual table submitted for analysis presented in Table 12 (I've excluded most table cells with < 10 frequencies per cell). Because up to two orientation colours may be classed as "selected" for an individual, there are more observations (frequencies) than cases in these tables; each table incorporates all observed orientation frequencies associated with each MBTI type.

Table 11: The complete frequency table for VO selected rejected VO orientations and MBTI types

Observed Table (Frequencies) (Accepted Rejected (2) VO x MBTI Type - for Correspondence Analysis.sta) Row variables: MBTI Profile(22) Column variables: Orientation(7)								
	Purple	Red	Blue	Orange	Green	Yellow	Turquoise	Total
ESTP	2	0	0	0	0	1	9	12
ENTJ	20	8	0	2	0	4	51	85
ESTJ	15	4	0	2	1	20	49	91
ENTP	8	3	1	0	0	1	15	28
ISTP	1	0	0	0	0	1	7	9
INTP	10	3	0	0	0	2	11	26
INTJ	8	3	0	0	0	3	15	29
ENFJ	1	3	0	1	0	1	2	8
ISTJ	4	0	0	1	1	12	30	48
ESTJ/P	0	0	0	0	0	2	5	7
ISFP	0	1	0	0	0	0	0	1
INT/FJ	1	0	0	0	0	0	1	2
ESFJ	0	0	0	0	0	1	2	3
ENTJ/P	2	1	0	0	0	0	2	5
INFP	1	2	0	1	0	0	1	5
ENFP	0	2	0	0	0	3	4	9
IS/NTJ	0	0	0	0	1	0	1	2
ESFP	0	0	0	0	0	1	0	1
ISFJ	0	0	0	0	0	1	1	2
INFJ	0	1	0	1	0	1	2	5
INT/FP	0	0	0	0	0	1	0	1
ENT/FJ/P	0	0	0	0	0	0	1	1
Total	73	31	1	8	3	55	209	380

Table 12: The subset frequency table for VO selected rejected VO orientations and MBTI types (most marginals > 10))

	Observed Table (Frequencies)				
	Row variables: MBTI Profile(10)				
	Column variables: Orientation(4)				
	Purple	Red	Yellow	Turquoise	Total
ESTP	2	0	1	9	12
ENTJ	20	8	4	51	83
ESTJ	15	4	20	49	88
ENTP	8	3	1	15	27
ISTP	1	0	1	7	9
INTP	10	3	2	11	26
INTJ	8	3	3	15	29
ENFJ	1	3	1	2	7
ISTJ	4	0	11	30	45
ENFP	0	2	3	4	9
Total	69	26	47	193	335

Figure 2 shows the result of the Correspondence Analysis (CA) on Table 9's data.

Figure 2: The 2-dimensional CA of VO selected rejected orientations and MBTI types

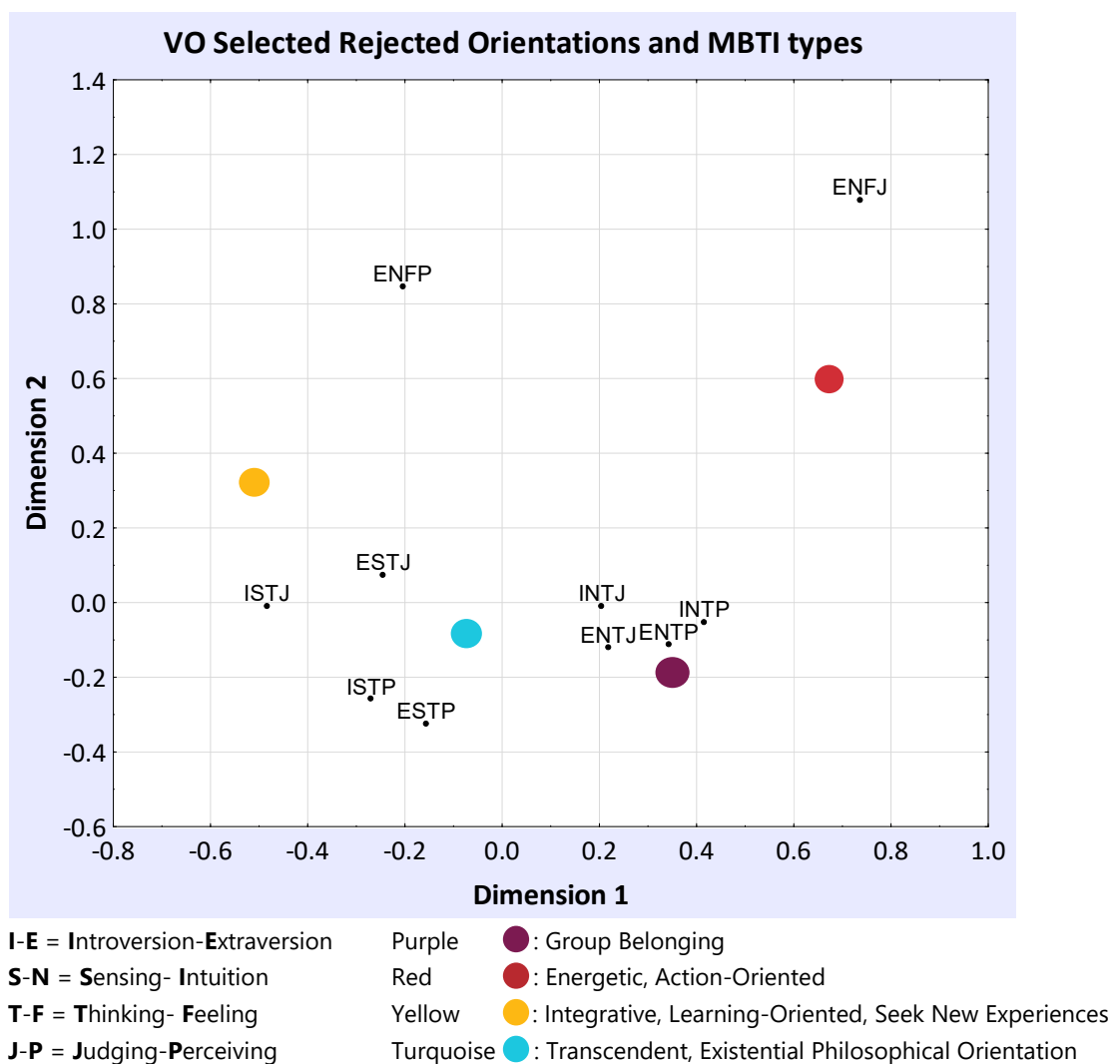


Table 13: Correspondence Analysis solution indices for MBTI types

Row Name	Input Table (Rows x Columns): 10 x 4 Standardization: Row and column profiles			
	Row Number	Quality	Cosine <sup>2</sup> Dim.1	Cosine <sup>2</sup> Dim.2
ESTP	1	0.81	0.15	0.66
ENTJ	2	0.85	0.65	0.20
ESTJ	3	0.88	0.80	0.07
ENTP	4	1.00	0.90	0.10
ISTP	5	0.71	0.37	0.34
INTP	6	0.73	0.71	0.01
INTJ	7	0.88	0.88	0.00
ENFJ	8	0.97	0.31	0.66
ISTJ	9	0.99	0.99	0.00
ENFP	10	0.98	0.05	0.93

Table 14: Correspondence Analysis solution indices for the VO selected rejected orientations

Column Name	Input Table (Rows x Columns): 10 x 4 Standardization: Row and column profiles			
	Column Number	Quality	Cosine <sup>2</sup> Dim.1	Cosine <sup>2</sup> Dim.2
Purple	1	0.82	0.66	0.16
Red	2	0.98	0.54	0.45
Yellow	3	0.95	0.68	0.27
Turquoise	4	0.71	0.29	0.42

The analysis presents interesting relationships between certain MBTI clusters and value orientation rejections. It appears that people who choose NT cluster tend to reject Purple value orientation. The individuals who show NT preferences tend to be individualistic and conceptual, longing for autonomy, while Purple orientation focuses on deriving a sense of identity from group belonging. Those who show preference for ST cluster seem to reject Turquoise value orientation. ST functional pair indicates attention to the tangible realities and facts. These individuals seem to prefer a more structured and conventional approach, while Turquoise value orientation is characterised by a philosophical abstract and transcendent approach which can appear to be removed from reality. Furthermore, ST cluster seems in a somewhat negative relationship to Yellow value orientation which emphasises the intangible world of ideas and complexity and is contrary to the traditional and sensory approach of individuals with ST cluster.

## 2.2 Histograms of MBTI scale scores x Values Orientations

In these series of analyses, we plot the percentage scoring at each score level on an MBTI attribute against the Values Orientations. That is, for each colour orientation, the number of people scoring at each score level on an MBTI attribute is expressed relative to the total number of scores for that particular colour. We then create a three-dimensional bivariate histogram which incorporates each of the values orientation histograms for an MBTI attribute. In this way, any trends in the scoring patterns of accepted or rejected orientations for any particular MBTI attribute can be easily discerned. As before, because up to three accepted values orientations can be selected for an individual, based upon that individual's responses, the histogram data represent the observed MBTI scores associated with an orientation, irrespective of whether it was selected as a 1<sup>st</sup>, 2<sup>nd</sup>, or 3<sup>rd</sup> selected orientation. For example, if an individual possesses three selected orientations of Red, Green, and Blue, and an MBTI extraversion score of 15, then their 'record' is expanded into three cases in the data file presented to the histogram analysis:

- Red = MBTI score of 15
- Green = MBTI score of 15
- Blue = MBTI score of 15

The same input data-file construction approach is taken for the selected rejected orientations, where up to two rejected orientations may be selected for an individual.

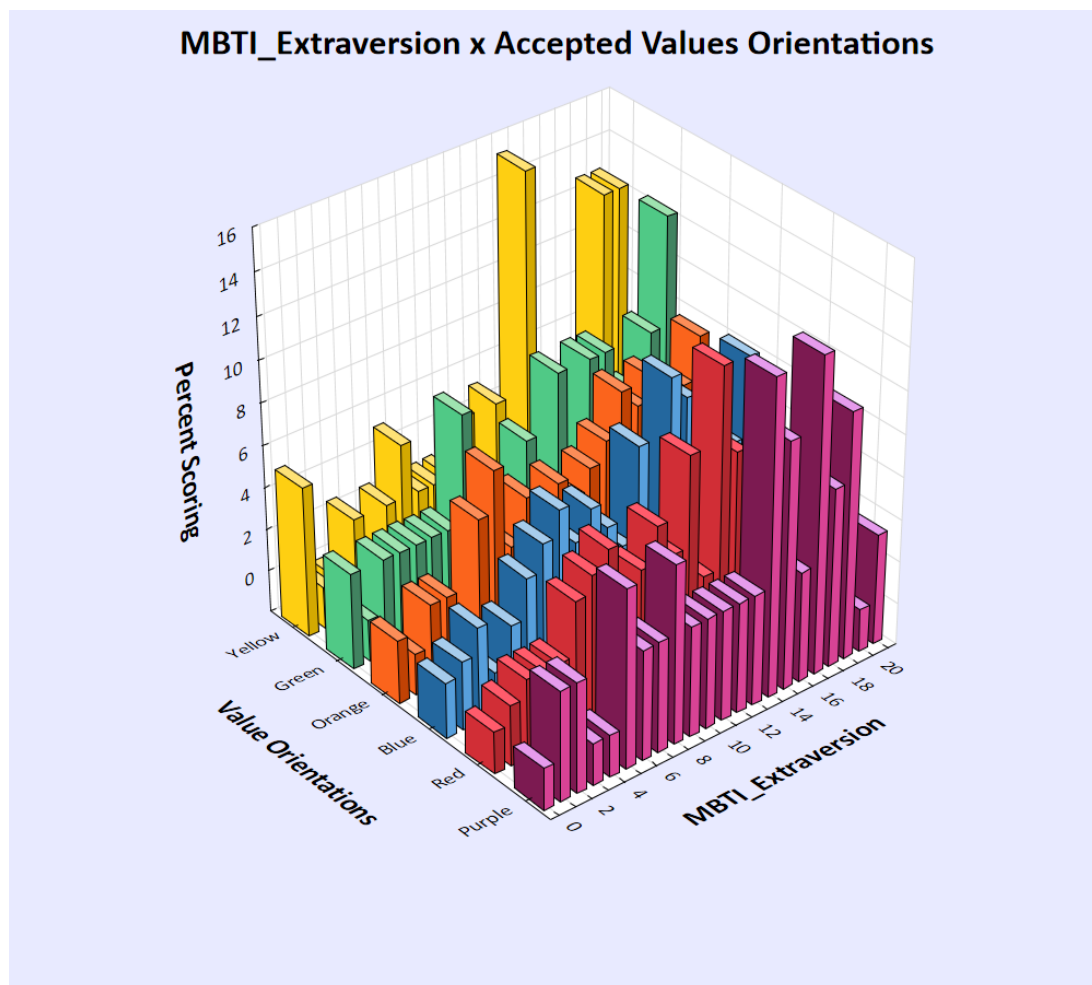
### 2.2.1 Sequential Bivariate Histograms – Selected Accepted Orientations

For all eight MBTI variables, only three individuals were assigned a Turquoise selected orientation. Therefore, this orientation was excluded from the graphical analysis for selected orientations.

Table 15: The numbers of cases associated with each selected accepted orientation (*applicable to all eight selected accepted orientation bivariate histograms*)

Orientation	No. of aggregated records with MBTI scores
	31
	117
	160
	101
	39
	39
	3

Figure 3: Bivariate 3D Histogram – Accepted Values Orientations x MBTI Extraversion scores





Here, the trend is for nearly all orientations to show an increasing % of cases toward the higher Extraversion score levels. This shared monotonic trend can be seen in the Pearson correlation matrix between percent scoring at each score level for each value orientation:

Table 16: Pearson correlations between percent of cases scoring at each MBTI score-level for Extraversion

Variable	Marked correlations are significant at $p < .05000$ N=22 (Casewise deletion of missing data)					
	Purple	Red	Blue	Orange	Green	Yellow
Purple	1.00	0.64	0.81	0.64	0.07	0.33
Red	0.64	1.00	0.85	0.71	0.17	0.54
Blue	0.81	0.85	1.00	0.70	0.24	0.50
Orange	0.64	0.71	0.70	1.00	0.27	0.49
Green	0.07	0.17	0.24	0.27	1.00	0.38
Yellow	0.33	0.54	0.50	0.49	0.38	1.00

The Green orientation is the one orientation that does not share a moderate to strong monotonic relationship with the remaining values orientations histogram percentages.

The above histogram results have to be interpreted considering the sample group which is relatively homogenous and consists of department managers, general managers as well as executives. Interactions with other people are thus crucial for an effective fulfilment of responsibilities.

It seems that monotonicity can be observed with all value orientations in relation to extraversion apart from Green value orientation. Green value orientation is characterised by focus on building meaningful relationships and propagating the harmony among people above achievements and the traditional sense of success. Furthermore, the value orientation takes on a theoretical, emotional and introspective perspective which can be associated with different preference scores for Extraversion.

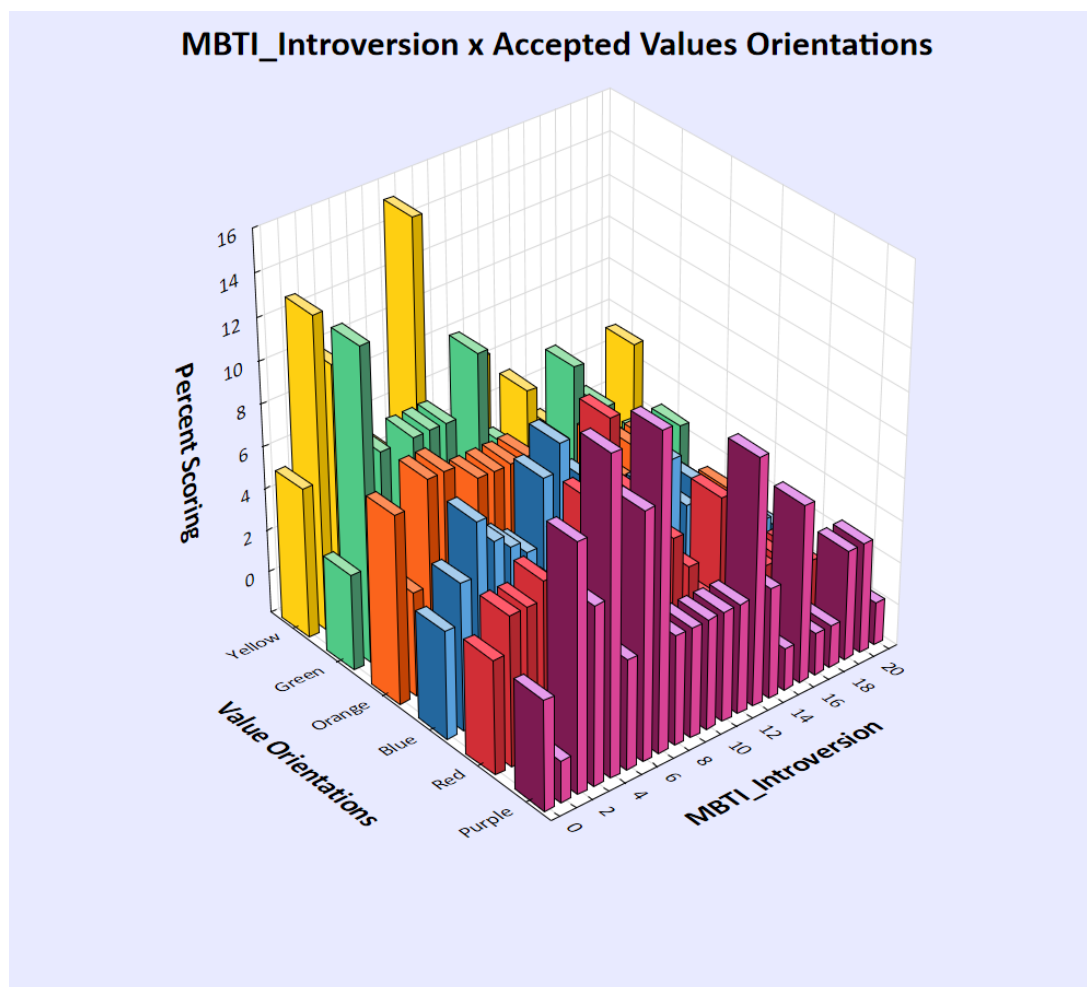
The strongest monotonicity can be observed in relation to Blue, Red and Orange value orientations. It is likely to be clearly presented due to the larger part of the sample group accepting these orientations. The following interpretations can be derived from these relationships:

The more extraverted an individual, the greater the need they have for social interaction and drawing energy from the external environment. Blue value orientation is concerned with reliance on guidance, structure and procedural approach provided by a leader/supervisor/authority. Red value orientation is concerned with establishing control over the environment and can be perceived as expressive and dominant. Orange value orientation is characterised by seeking opportunities, networking and concentrating on perceptions of others. Thus it can be interpreted that the greater the acceptance of these orientations, the greater the preference for the external world to provide certainty, possibilities and energy.

Purple value orientation presents a relative monotonicity with the preference for Extraversion. It appears that the stronger the acceptance of Purple, the stronger the preference for Extraversion. Purple orientation focuses on deriving a sense of identity and security from belonging to a certain group (traditional, religious, cultural etc.). It is understandable that individuals who strongly accept this orientation would present stronger preference for the external world to draw energy from.

It should be noted that the sample pertaining to Green, Yellow and Purple value orientation is significantly smaller in comparison to Red, Blue and Orange value orientations. Thus, further studies are suggested to improve the sample numbers which contribute to meaningful interpretation.

Figure 4: Bivariate 3D Histogram – Accepted Values Orientations x MBTI Introversion scores



Here, that same monotonicity is observed between orientation histogram percentages, although the bulk of cases are now located nearer the lower Introversion score-ranges. As expected, the Green orientation is the one orientation that does not share a moderate to strong monotonic relationship with the remaining values orientations histogram percentages.

Table 17: Pearson correlations between percent of cases scoring at each MBTI score-level for Introversion

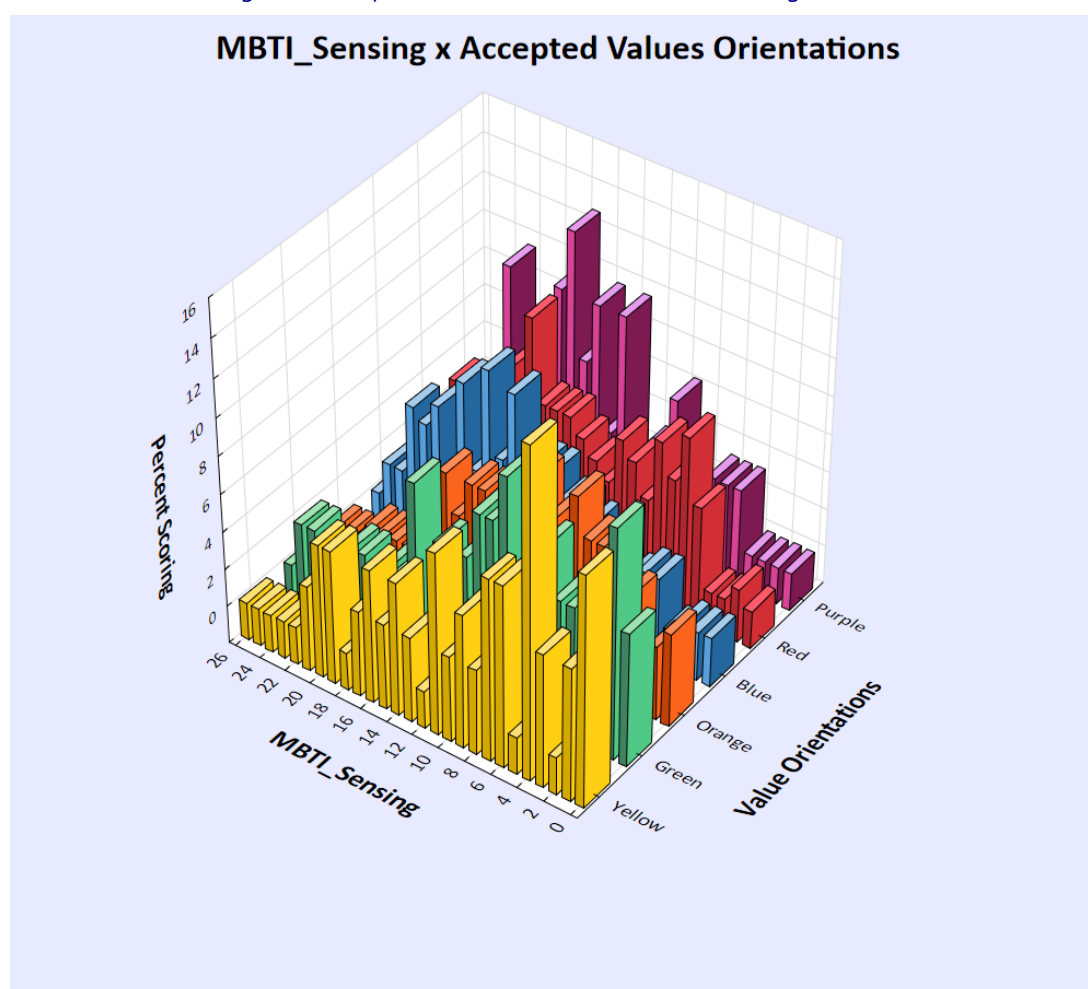
Variable	Marked correlations are significant at $p < .05000$ N=22 (Casewise deletion of missing data)					
	Purple	Red	Blue	Orange	Green	Yellow
Purple	1.00	0.51	0.71	0.51	0.03	0.36
Red	0.51	1.00	0.87	0.63	0.17	0.56
Blue	0.71	0.87	1.00	0.69	0.31	0.55
Orange	0.51	0.63	0.69	1.00	0.28	0.44
Green	0.03	0.17	0.31	0.28	1.00	0.32
Yellow	0.36	0.56	0.55	0.44	0.32	1.00

As mentioned earlier, the sample consists mainly of managers and executives who are required to deal with people on a regular basis. Thus they need to most likely present greater preference for the interaction with the external world and less focus on the internal world as means of gathering energy. The sample group that showed preference for Introversion is significantly smaller than the extraverted group within the main sample.

Moderate decreasing monotonicity observed is indicative of a minor relationship between value orientations and MBTI preference for Introversion. The strongest monotonic relationship is evident for Blue, Red and Purple value orientations and it emphasises the insight of seeking structure, certainty and control from external and not internal environment.

Low monotonicity is observed with Yellow and Orange value orientations, and lack of it with Green value orientation.

Figure 5: Bivariate 3D Histogram – Accepted Values Orientations x MBTI Sensing scores



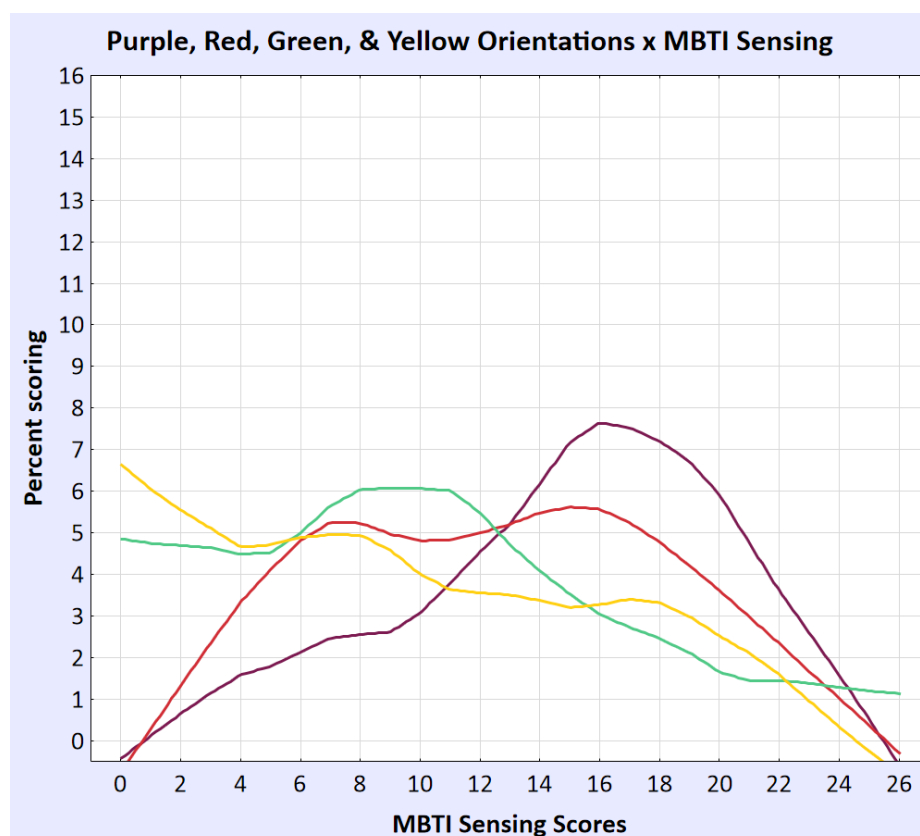
Here there definitely appears to be trend toward lower Sensing scores for Yellow and higher for Purple. Looking at the monotonicity relations we see:

Table 18: Pearson correlations between percent of cases scoring at each MBTI score-level for Sensing

Variable	Marked correlations are significant at $p < .05000$ N=27 (Casewise deletion of missing data)					
	Purple	Red	Blue	Orange	Green	Yellow
Purple	1.00	0.45	0.66	0.27	-0.07	-0.10
Red	0.45	1.00	0.71	0.69	0.12	0.11
Blue	0.66	0.71	1.00	0.32	-0.22	-0.13
Orange	0.27	0.69	0.32	1.00	0.37	0.23
Green	-0.07	0.12	-0.22	0.37	1.00	0.39
Yellow	-0.10	0.11	-0.13	0.23	0.39	1.00

There is both a loss of monotonicity and indications of negative monotonic relationships. However, the Pearson correlation is a rather insensitive way of looking at the monotonicity we can see 'by eye' in Figure 5, mainly because the trends are likely non-linear. An optimal way of looking at the trends is to plot them directly using a lowess smoothing function on the data points. The result of using a moderate smoothing stiffness parameter of 0.4 on the purple, red, green, and yellow orientation score-frequency percentages is provided in Figure 6:

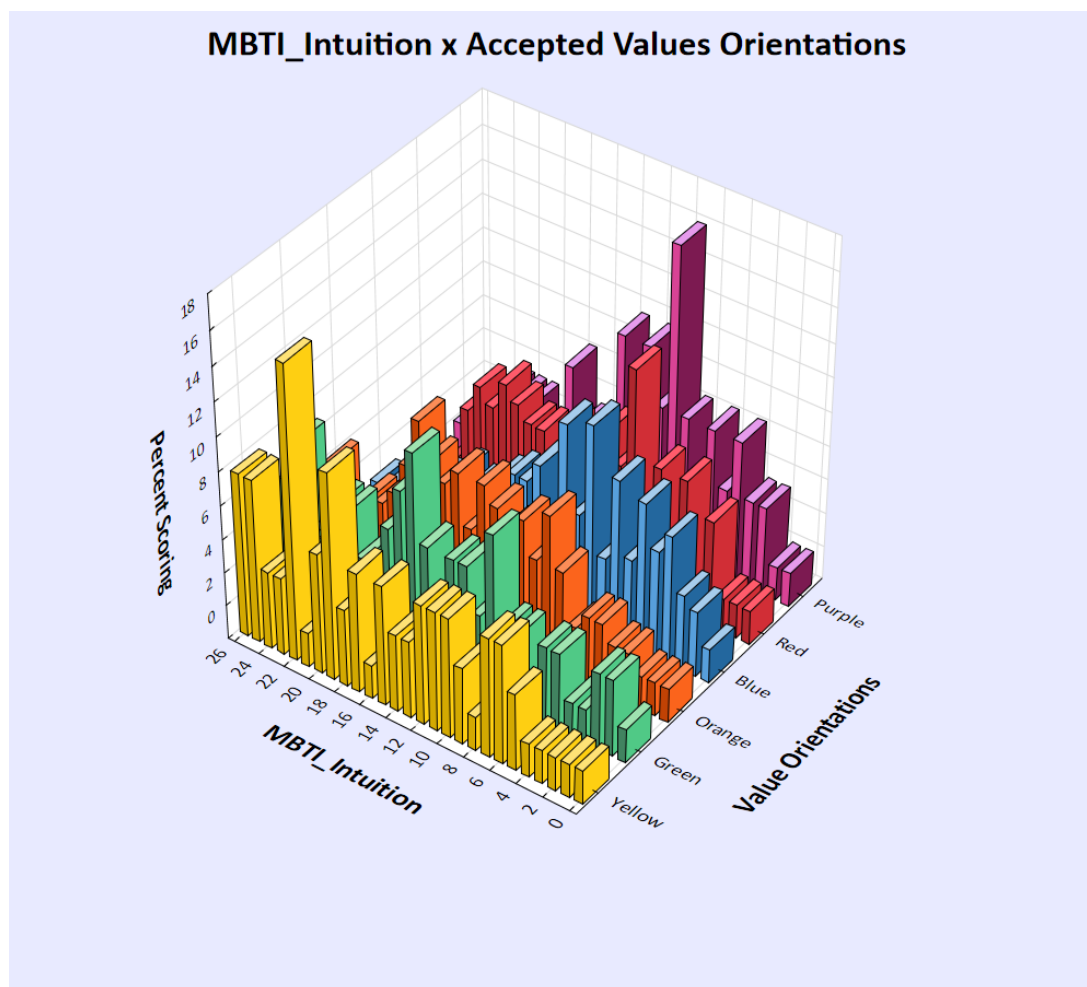
Figure 6: Purple, Red, Green, and Yellow Accepted Orientations x MBTI Sensing score frequency percentages



The non-linear trends are now much more clearly visible, with individuals assigned Purple and Red orientations showing higher rates of MBTI Sensing scores above about 14 than those assigned Green and Yellow orientations. Conversely, those assigned Purple and Red orientations show lower Sensing score rates at low Sensing score magnitudes than do those assigned Green and Yellow orientations.

Purple and Red orientations can be characterised as realistic, practical and here-and-now driven, which explains higher scores on Sensing (focusing on sensory, tangible and present data). On the contrary, Green and Yellow value orientations are concerned with abstract ideas and notions thus individuals who adhere to these orientations would be less inclined to focus on concrete and tangible information (Sensing).

Figure 7: Bivariate 3D Histogram – Accepted Values Orientations x MBTI Intuition scores



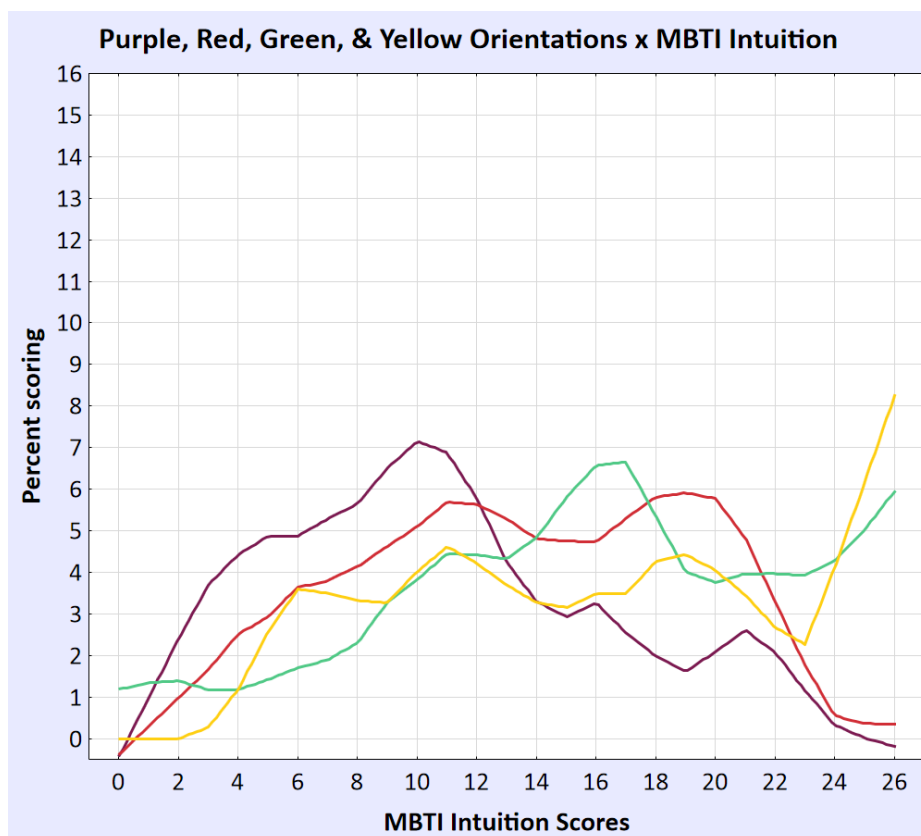
The opposite effect can be seen for MBTI Intuition. Here there definitely appears to be trend toward higher Intuition scores for Yellow and lower for Purple. Looking at the monotonicity relations we see:

Table 19: Pearson correlations between percent of cases scoring at each MBTI score-level for Intuition

Variable	Marked correlations are significant at $p < .05000$ N=27 (Casewise deletion of missing data)					
	Purple	Red	Blue	Orange	Green	Yellow
Purple	1.00	0.50	0.71	0.27	0.01	-0.09
Red	0.50	1.00	0.73	0.72	0.14	0.15
Blue	0.71	0.73	1.00	0.33	-0.14	-0.05
Orange	0.27	0.72	0.33	1.00	0.41	0.25
Green	0.01	0.14	-0.14	0.41	1.00	0.26
Yellow	-0.09	0.15	-0.05	0.25	0.26	1.00

There is both a loss of monotonicity and indications of negative monotonic relationships. However, as noted above, the Pearson correlation is a rather insensitive way of looking at the monotonicity we can see 'by eye' in Figure 7, mainly because the trends are likely non-linear. So, we again plot them directly using a lowess smoothing function on the data points. The result of using a moderate smoothing stiffness parameter of 0.4 on the purple, red, green, and yellow orientation score-frequency percentages is provided in Figure 8:

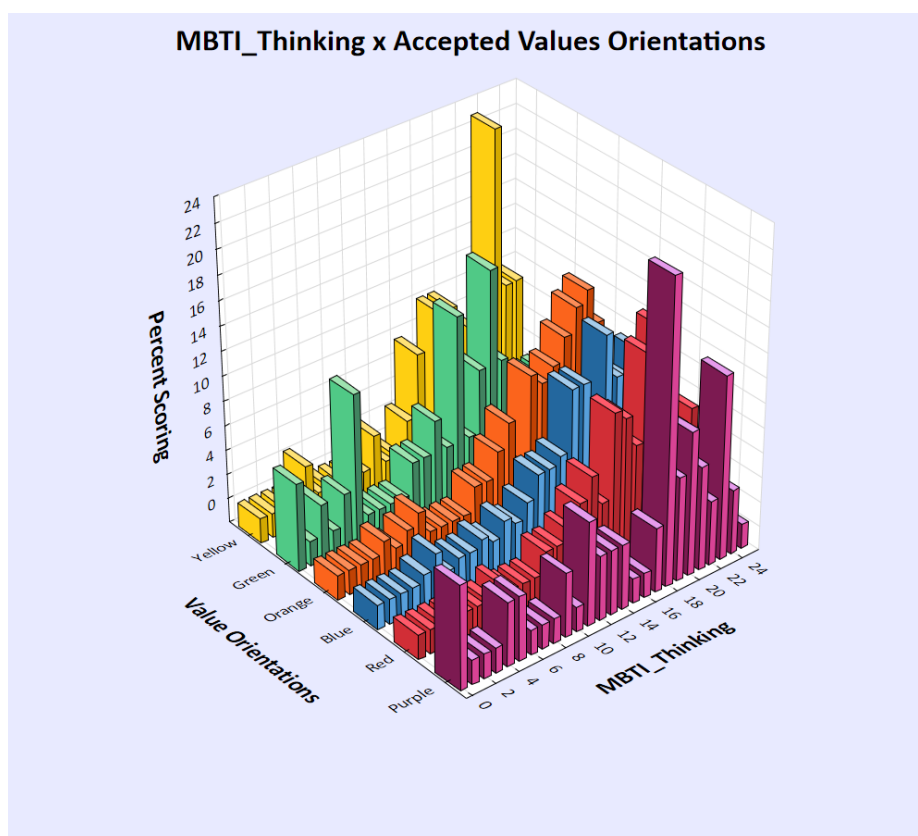
Figure 8: Purple, Red, Green, and Yellow Accepted Orientations x MBTI Intuition score frequency percentages



The non-linear trends are now much more clearly visible although less-well-defined than in Figure 6, with individuals assigned Purple and Red orientations showing higher Intuition score rates at low Intuition score magnitudes than those assigned Green and Yellow orientations. However, the converse only applies to the purple, green and yellow orientations.

Intuition is related to considering future possibilities and ideas. As Purple and Red orientations tend to be concerned with clear-cut and tangible information, the individuals accepting Purple and Red would most likely apply less Intuition. On the other hand, Yellow and Green orientations seem to be associated with ideas and concepts which correspond with the understanding of Intuition.

Figure 9: Bivariate 3D Histogram – Accepted Values Orientations x MBTI Thinking scores

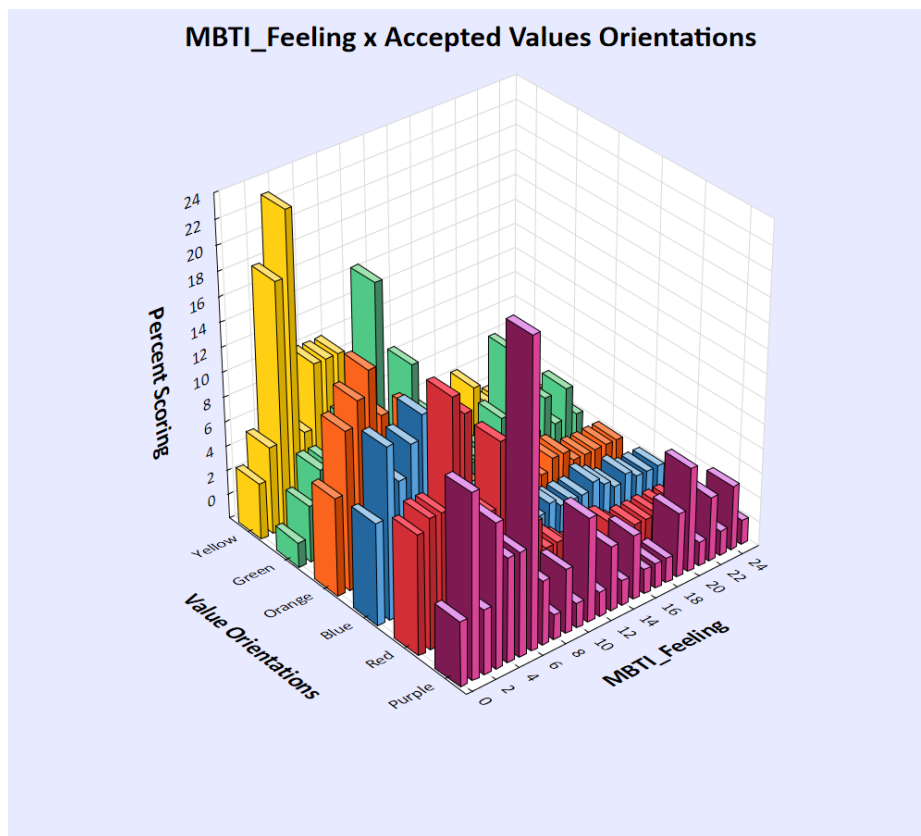


Based on the histogram, it can be concluded that greater monotonicity is observed between Thinking preference and Orange, Blue and Red values orientations. Lesser relationship surfaced between Thinking and Yellow value orientation and relatively no monotonicity is perceived between Thinking and Green and Purple orientations.

Thinking preference indicates focus on objective and logical information when making decisions. One tends to consider factual data and take an observer stance. Both Orange and Red value orientations tend to make decisions based on achievement of results and maximising profit which most of the time is in line with Thinking preference. Blue orientation is concerned with abiding by the rules and guidelines. Their decisions are rarely emotional, but more driven by the structure and order.

The lack of monotonicity between Thinking preference and Purple orientation is likely to be due to the value orientation concentrating on certainty and guidance. Decisions are rarely made independently. Further, Green orientation tends to make decisions based on subjective stances, such as values, feelings and compromise as well as reasoning. Hence no significant relationship can be observed.

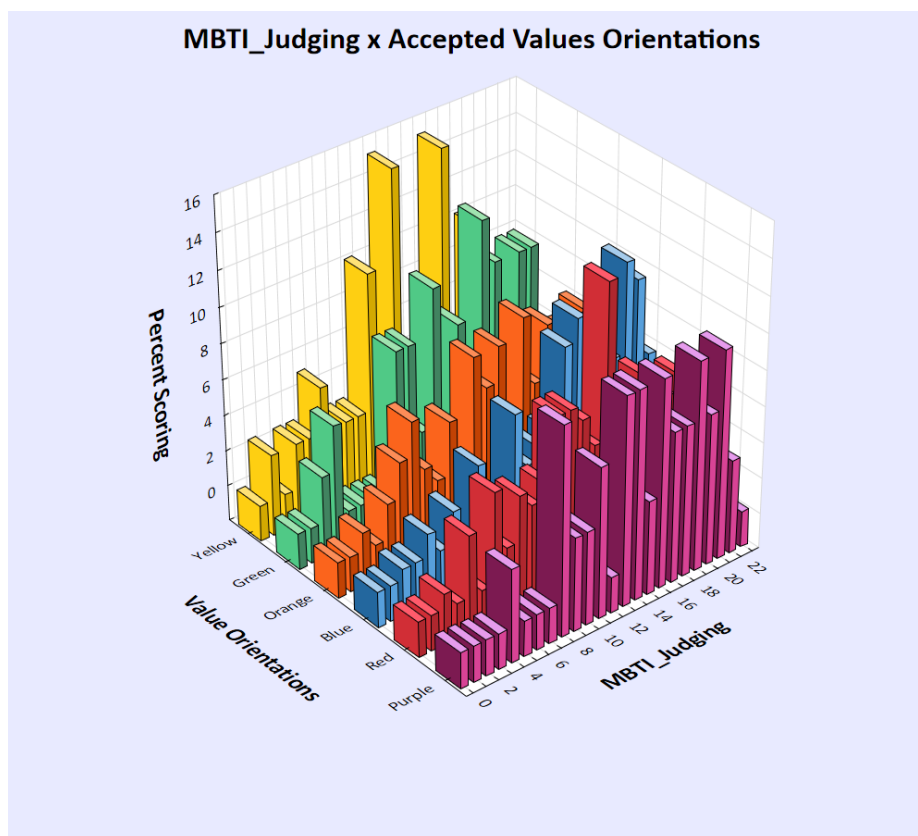
Figure 10: Accepted Values Orientations x MBTI Feeling scores



Decreasing monotonicity can be observed between Feeling preference and Yellow, Orange, Blue and Red value orientations. Feeling preference is focused on subjective information, personal priorities and relationships. All of the above value orientations are in general more concerned with objective, practical and factual information when decision-making hence the monotonically decreasing function is present. Purple and Green orientations tend to incorporate more emotions, subjective values and perceptions into their decisions along with reasoning, hence less monotonicity is present.

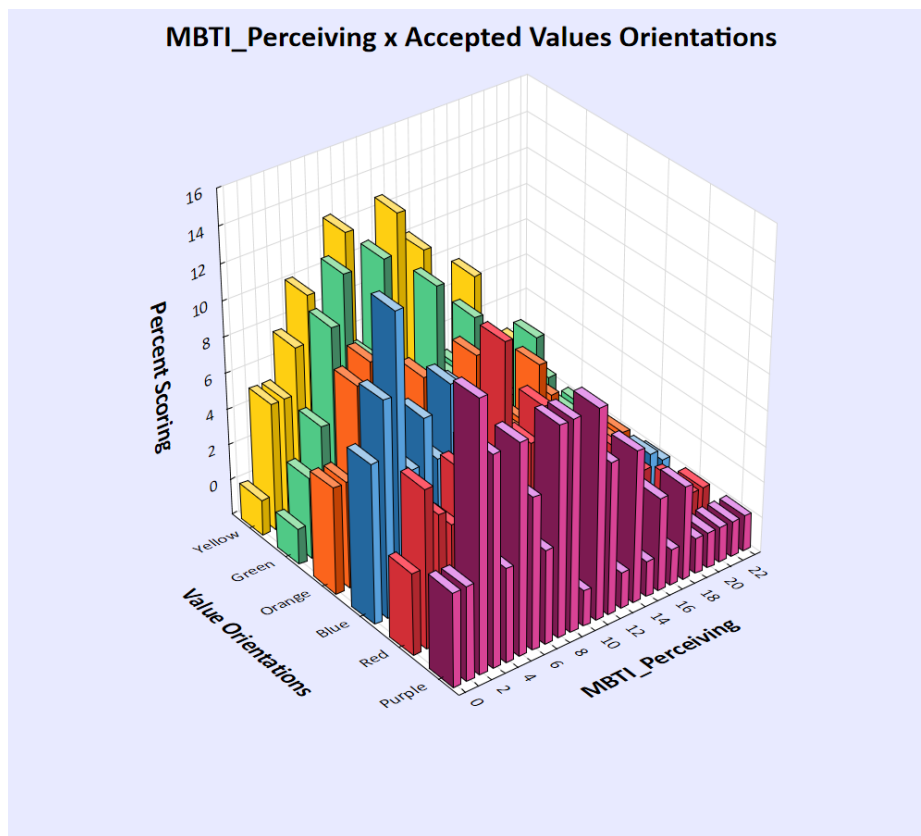


Figure 11: Accepted Values Orientations x MBTI Judging scores



The greatest monotonic relationship seems to be present between Judging preference and Blue value orientation. Judging preference is concerned with a planned and organised approach to making sense of the external world. Blue orientation shows a similar approach of structuring and ordering the world in terms of "right and wrong".

Figure 12: Accepted Values Orientations x MBTI Perceiving scores



Similarly as above, greatest decreasing monotonic relationship is found between Perceiving preference and Blue value orientation. While Blue orientation prefers to be more organised, structured and orderly, Perceiving preference is focused on a more experiential and spontaneous approach to making sense of the world.

### 2.2.2 Sequential Bivariate Histograms – Selected Rejected Orientations

For all eight MBTI variables, fewer than 10 individuals were assigned a Blue, Orange, or Green *rejected* orientation. Therefore, these orientations were excluded from the graphical analysis for selected orientations.

Table 20: The numbers of cases associated with each selected rejected orientation (*applicable to all eight selected rejected orientation bivariate histograms*)

Orientation	No. of aggregated records with MBTI scores
Purple	72
Red	31
Blue	1
Orange	9
Green	4
Yellow	55
Cyan	208

Figure 13: Bivariate 3D Histogram – Rejected Values Orientations x MBTI Extraversion scores

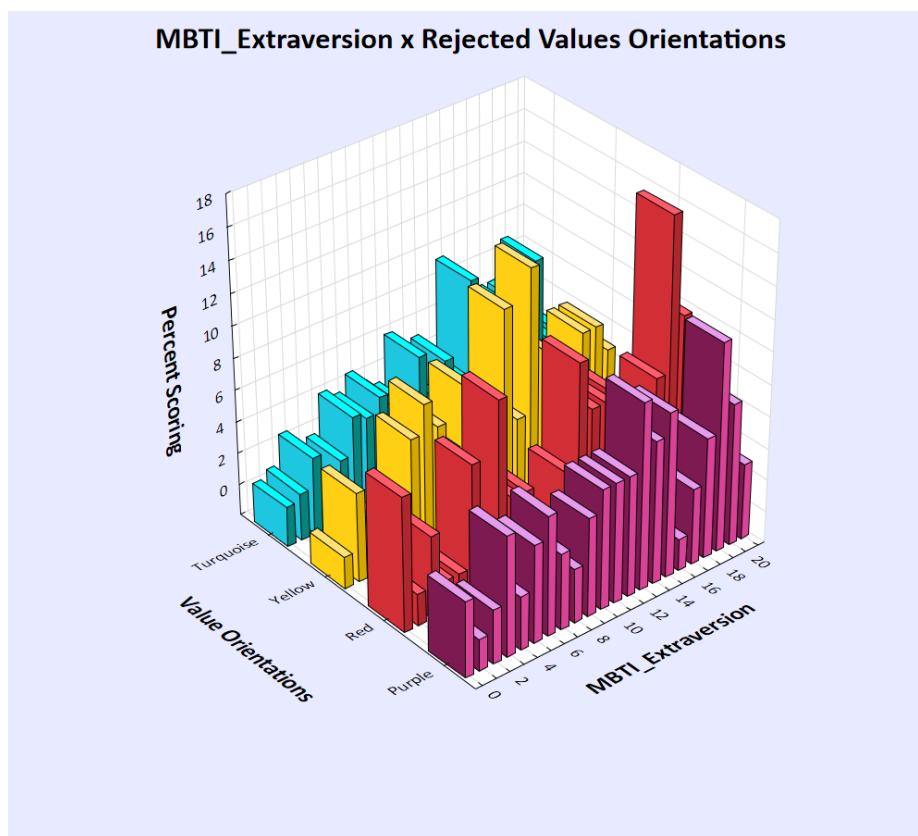


Figure 14: Bivariate 3D Histogram – Rejected Values Orientations x MBTI Introversion scores

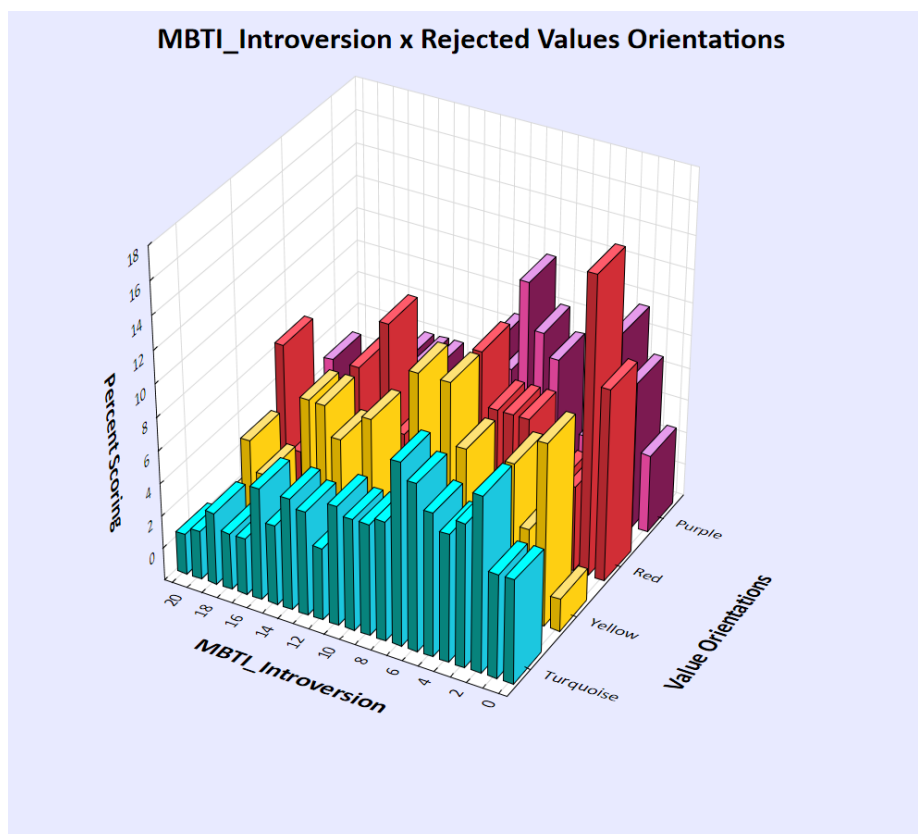


Figure 15: Bivariate 3D Histogram – Rejected Values Orientations x MBTI Sensing scores

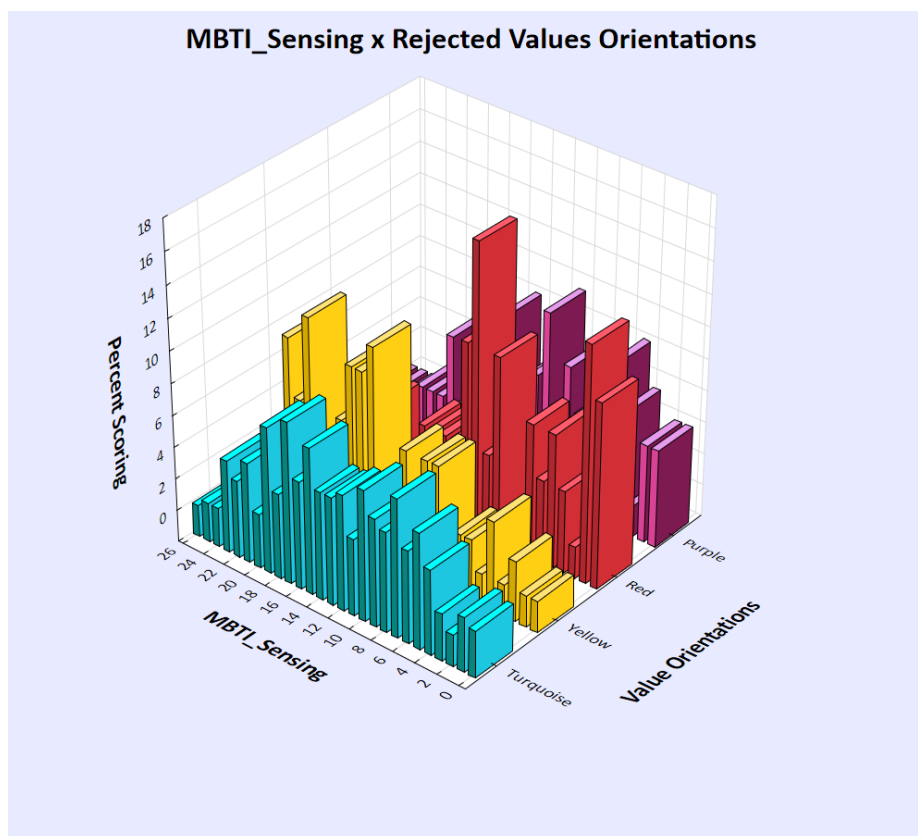


Figure 16: Bivariate 3D Histogram – Rejected Values Orientations x MBTI Intuition scores

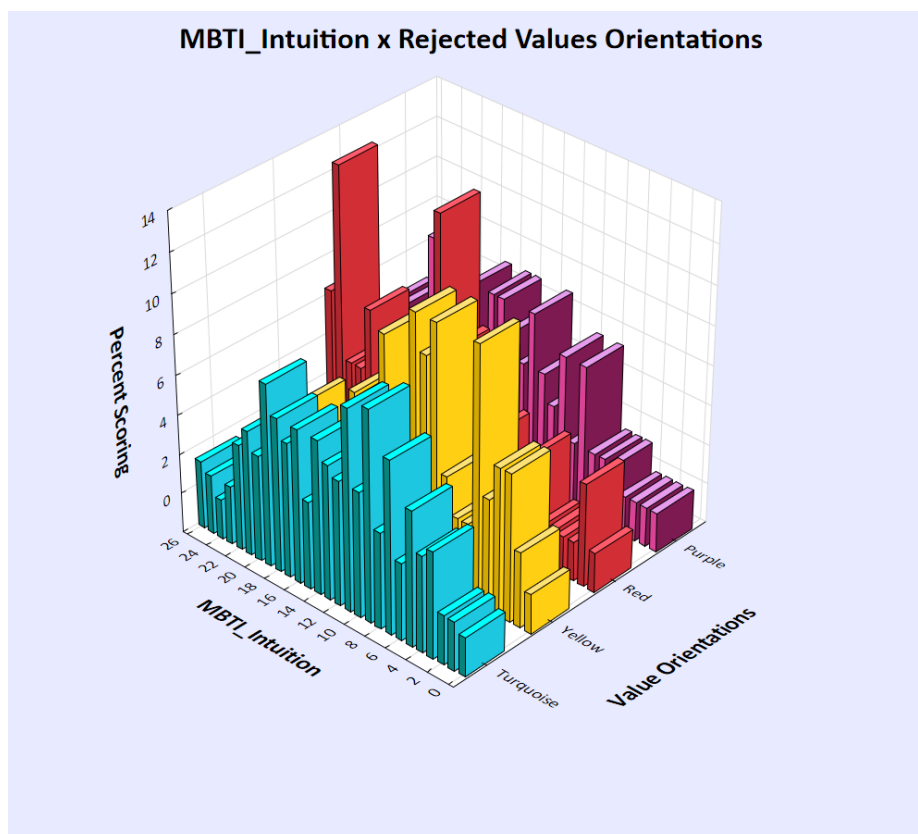
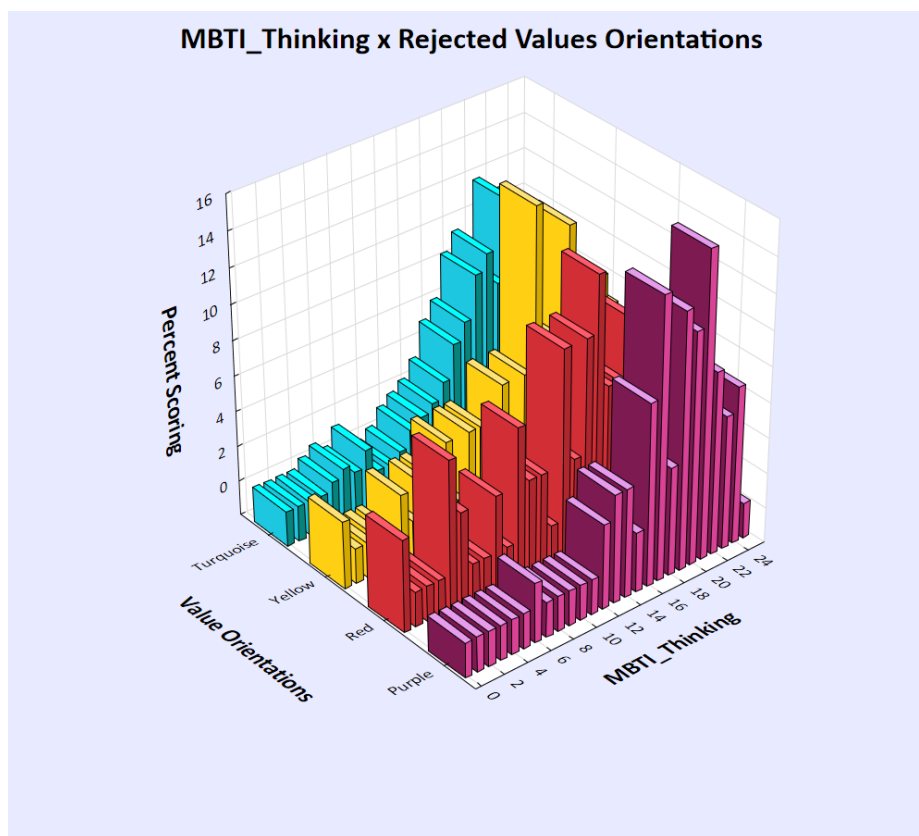
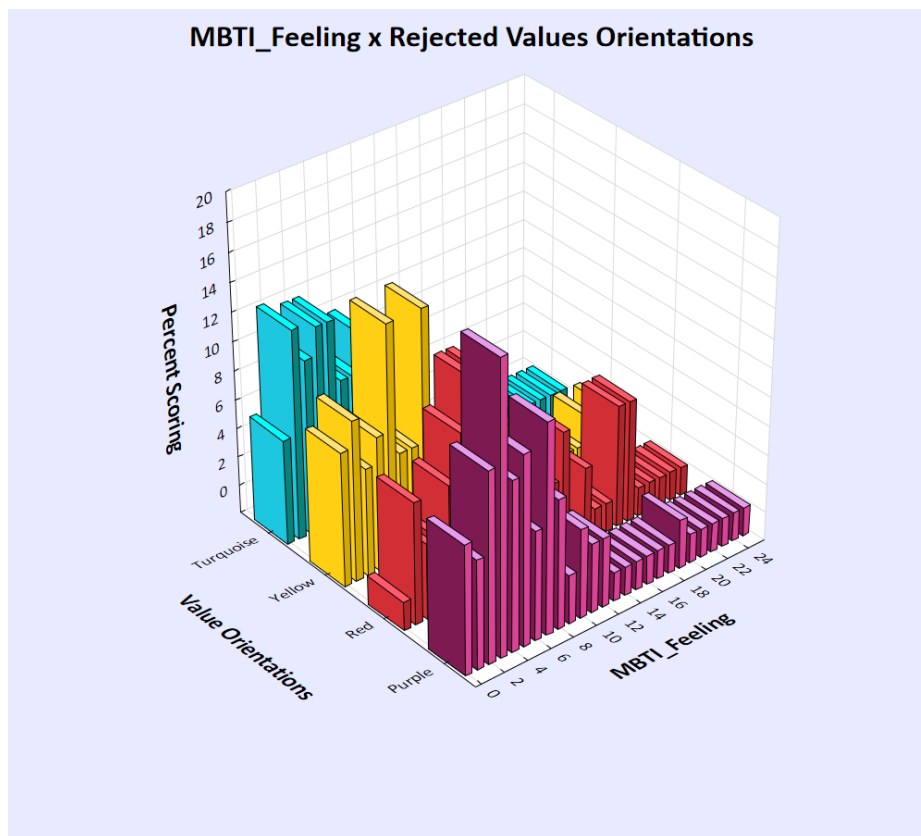


Figure 17: Bivariate 3D Histogram – Rejected Values Orientations x MBTI Thinking scores



Increasing monotonic relationship can be observed most strongly between Thinking preference and rejection of Purple and Turquoise value orientation. Decision-making with regards to Purple orientation is driven mostly by following authority and receiving guidance. Logical grounds are not necessarily the priority. Turquoise value orientation on the other hand presents a strongly abstract/transcendent approach to making sense of the world and decision-making would most likely be guided by such notions. It is concerned with moving beyond rational comprehension. The greater the rejection of these value orientations in the group, the greater the preference for Thinking (focus on objective and rational data to make decisions).

Figure 18: Bivariate 3D Histogram – Rejected Values Orientations x MBTI Feeling scores



The other side of the decision-making dimension, Feeling preference, presents decreasing monotonic relationship with Purple and Turquoise orientations. This means that the greater the preference for Feeling (making decisions based on subjective data, such as values, relationships), the lesser the rejection of Purple and Turquoise orientations. These values can appear to be more concerned with personal and emotional notions thus those who do not reject the orientations would be more inclined to prefer Feeling in decision-making.

Figure 19: Bivariate 3D Histogram – Rejected Values Orientations x MBTI Judging scores

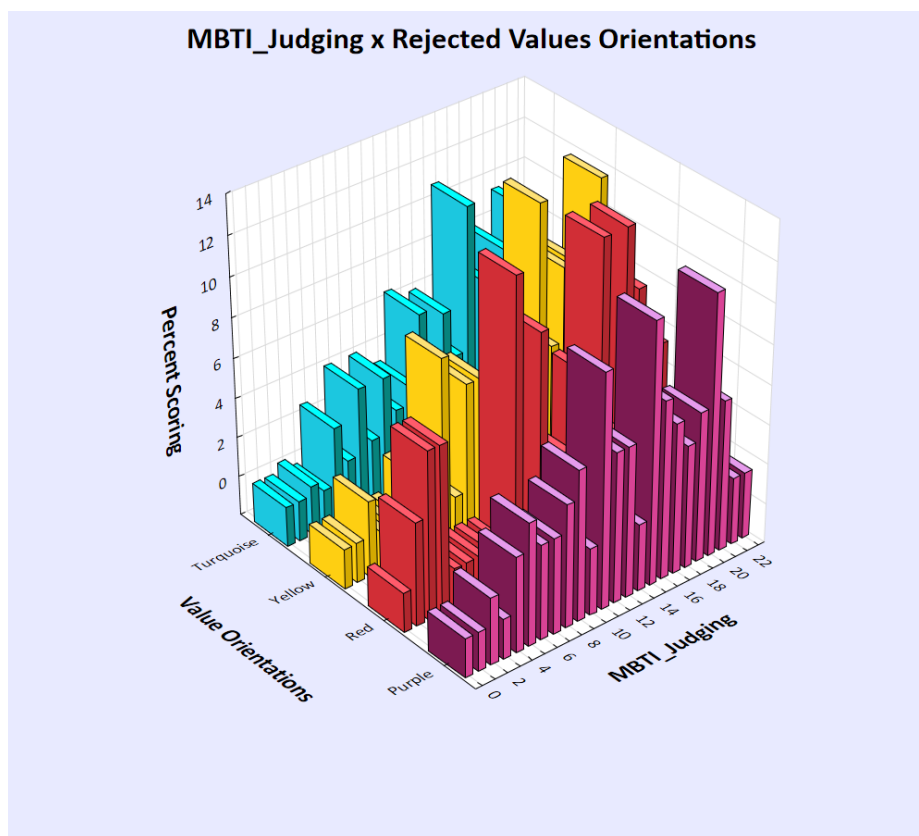
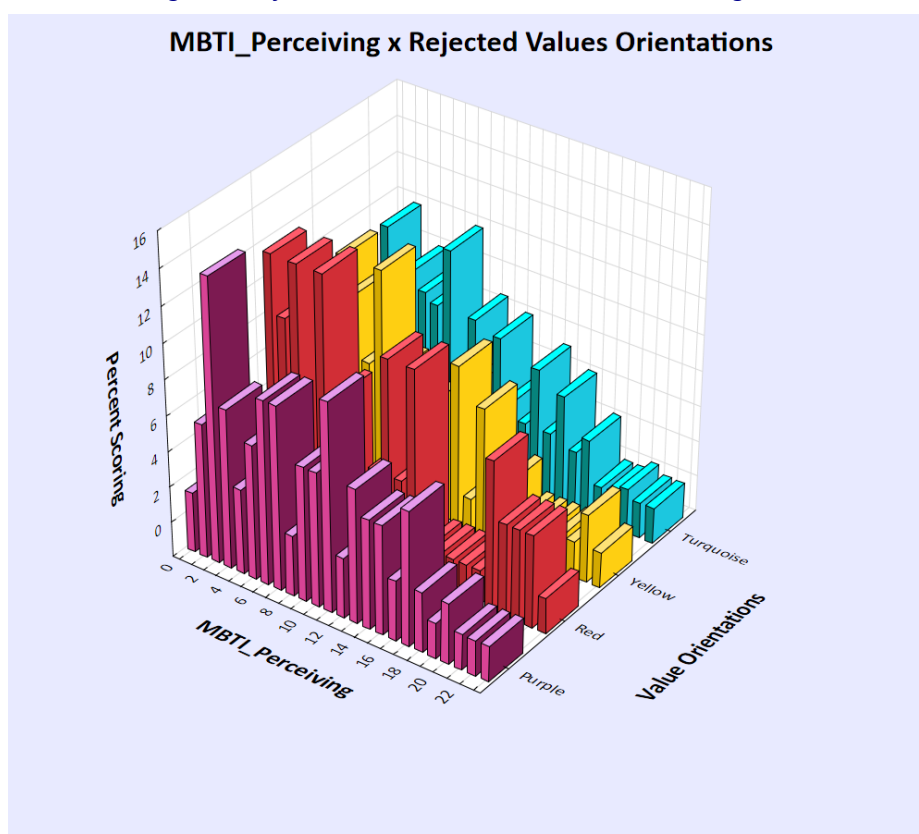


Figure 20: Bivariate 3D Histogram – Rejected Values Orientations x MBTI Perceiving scores



### 3. Selected Values Orientations and Belbin ranked team types

The Belbin Team Roles assessment is a self-report measure which identifies the preferred role an individual is most likely to adopt in a team situation. The team roles reflect different ways in which team members approach tasks and how they prefer to relate to each other. For example, the more **social** and people-oriented roles are depicted by the Coordinator; the Team Worker and Resource Investigator whereas the more **action-oriented** roles are illustrated by the Shaper; Implementer and Completer-Finisher. Lastly, the Plant and Monitor-Evaluator roles are referred to as the **thinking** roles. Although an individual can show preferences for several roles, the top three role preferences are considered here.

In these series of analyses, we again plot the percentage (now for each rank-value {1-3, highest rank = 1} rather than score) for every Belbin attribute against the Values Orientations. That is, for each colour orientation, the number of people assigned a particular rank for each Belbin attribute is expressed relative to the total number of ranks assigned for that particular colour. We then create a three-dimensional bivariate histogram which incorporates each of the values orientation histograms for a Belbin attribute. In this way, any trends in the scoring patterns of accepted or rejected orientations for any particular Belbin attribute can be easily discerned. As before, because up to three accepted values orientations can be selected for an individual, based upon that individual's responses, the histogram data represent the observed Belbin ranks associated with an orientation, irrespective of whether it was selected as a 1<sup>st</sup>, 2<sup>nd</sup>, or 3<sup>rd</sup> selected orientation. For example, if an individual possesses three selected orientations of Red, Green, and Blue, and an Belbin rank of 1, then their 'record' is expanded into three cases in the data file presented to the histogram analysis:

- Red = Belbin rank of 1
- Green = Belbin rank of 1
- Blue = Belbin rank of 1

The same input data-file construction approach is taken for the selected rejected orientations, where up to two rejected orientations may be selected for an individual.

Data for these analyses were drawn from Sample 1.

The homogeneity of the sample is an important aspect that is highlighted throughout this section. The sample is comprised of executives working within high-pressure environments where the attainment of results is paramount. Therefore the vast majority of this sample is represented by the Red-Blue-Orange combination of values, as well as the action-oriented Shaper role. There are also high percentages of individuals with a preference for the Coordinator role. Both the Shaper and Coordinator roles are considered to be leadership roles, however the style differs in terms of focus. While Shapers relentlessly drive results, Coordinators ensure that each task is delegated to others according to their perceived strengths of individual team members.



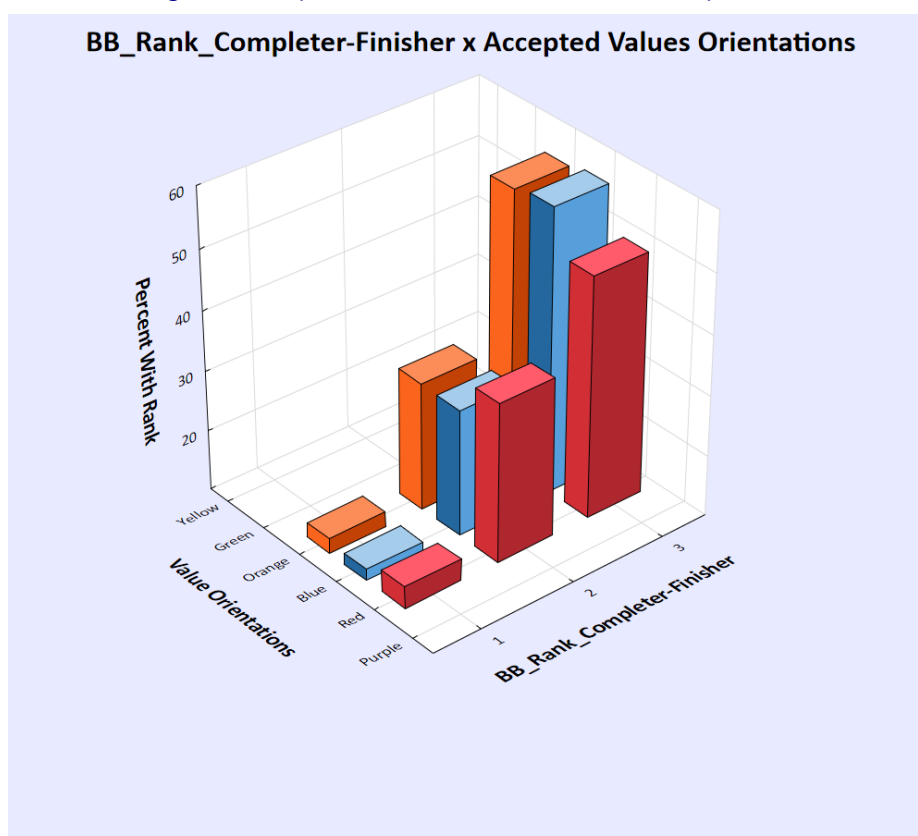
### 3.1 Sequential Bivariate Histograms – Selected Accepted Orientations

For all eight Belbin attributes, the numbers of aggregated records with Belbin ranks differ for each Belbin attribute, as only three ranks are assigned to a subset of the 8 Belbin attributes. So, for each graph showing the trend between values orientation and Belbin percentages for particular rank-values, the numbers of cases associated with each orientation is presented as a separate accompanying table. The graphs only include those values where case/observation-counts exceed 10.

Table 21: The numbers of cases associated with each selected accepted orientation, Completer-Finisher

Orientation	No. of aggregated records with a Belbin rank assigned
	7
	22
	42
	16
	3
	5
	0

Figure 21: Bivariate 3D Histogram – Accepted Values Orientations x Belbin Completer-Finisher Ranks



The results do not present a particularly strong differentiation among the Values associated with the Completer-Finisher role. However the combination of **Red-Blue-Orange** values appears to be far more prevalent than any of the other value orientations but the percentage is higher when Completer-Finisher is a *tertiary* role rather than a primary role, showing a monotonic trend. This could be attributed to the sample being comprised of executives who are unlikely to take on a primary role of ensuring that all details are polished to perfection or that nothing is

left to chance. It seems a higher percentage of this Red-Blue-Orange combination corresponds to a Completer-Finisher role that would only be adopted subsequent to other preferred roles.

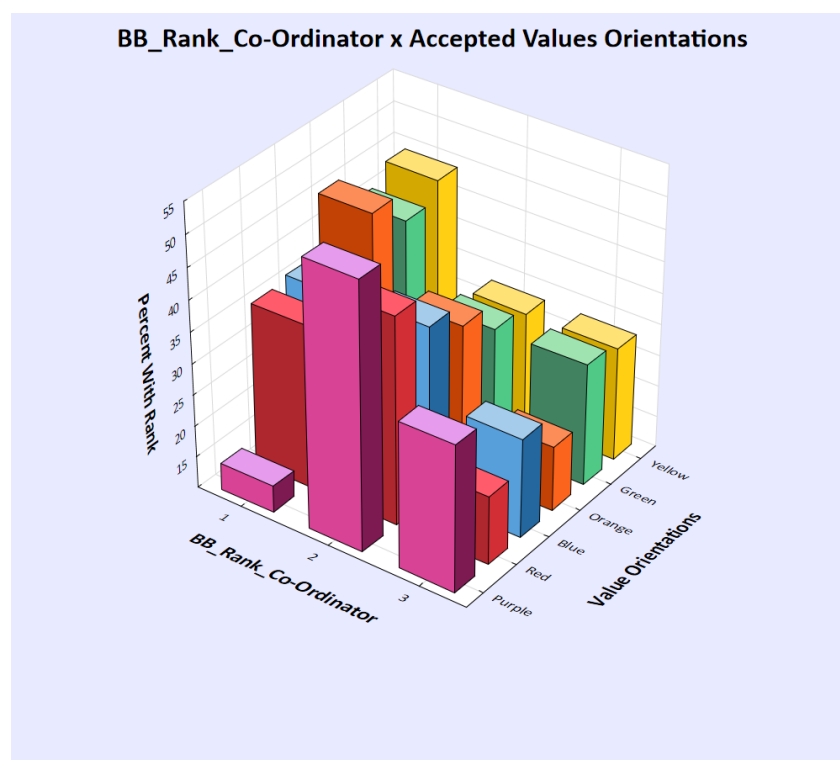
The combination of Red-Blue-Orange suggests a strongly results-driven approach, provided that an acceptable code of conduct is adhered to at all times. Of those with the Completer-Finisher role, the majority accepted Blue values. The Blue values in particular resonate with the Completer-Finisher's desire to reach levels of perfection. These external standards of perfection often become internalised and can be seen both among individuals with blue values as well as those who adopt a Completer-Finisher role. Blue values are characterised by a sense of duty, diligence and responsibility.

Negative manifestations of Blue values suggest rigidity, which may also be seen in the Completer-Finisher's "weakness" of refusing to delegate work to others because of a fear that the same standards of excellence would not be maintained. Similarly, Blue values are fear-driven as behaviour is driven by a desire to maintain moral standing and doing the correct thing while avoiding any unethical behaviour or actions that will be criticised.

Table 22: The numbers of cases associated with each selected accepted orientation, Coordinator

Orientation	No. of aggregated records with a Belbin rank assigned
Purple	21
Red	86
Blue	128
Orange	74
Green	34
Yellow	25
Light Blue	3

Figure 22: Bivariate 3D Histogram – Accepted Values Orientations x Belbin Coordinator Ranks



The **Red-Blue-Orange** combination appears to be more prominent in numbers among those who selected the Coordinator role however this is attributed to the high numbers of Red-Blue-Orange values across the entire culture from which the sample is drawn.

Of those participants who selected the Coordinator as their primary role, it appears that the Orange, Yellow and Green values are differentiated from the other values as being more prominent. Orange, Yellow and Green values are no longer fear-driven values, and are associated with a more intentional approach rather than an avoidant approach. Similarly, the Coordinator role is not associated with perfectionism or urgency, but a strengths-based approach where tasks are delegated according to the perceived strengths of the team members.

**Orange** values are characterised by a need for achievement, self-expression and opportunity-seeking behaviour. Coordinators are able to identify strengths in individual team members in order for the whole team to perform at an optimal level, which resonates with the Orange values of spotting “win-win” situations.

**Yellow** values are characterised by high levels of flexibility, a need for autonomy, desire for continuous learning and a focus on the big picture. Coordinators are unlikely to get stuck in detail, preferring the big-picture or holistic perspective of the whole being greater than the sum of its parts. This viewpoint is representative of both the Coordinator role and the Yellow value system.

**Green** values are the humanistic values, symbolised by acceptance of others and tolerance of diversity. The Coordinator role is a positive leader primarily because of their tendency to ensure that all team members have had their chance to express themselves. The Coordinator is unlikely to allow any individual to be dominated by another, preferring that all have something to contribute. This approach, characterised by equality and attentiveness to the strengths of others fits well with the altruistic Green orientation.

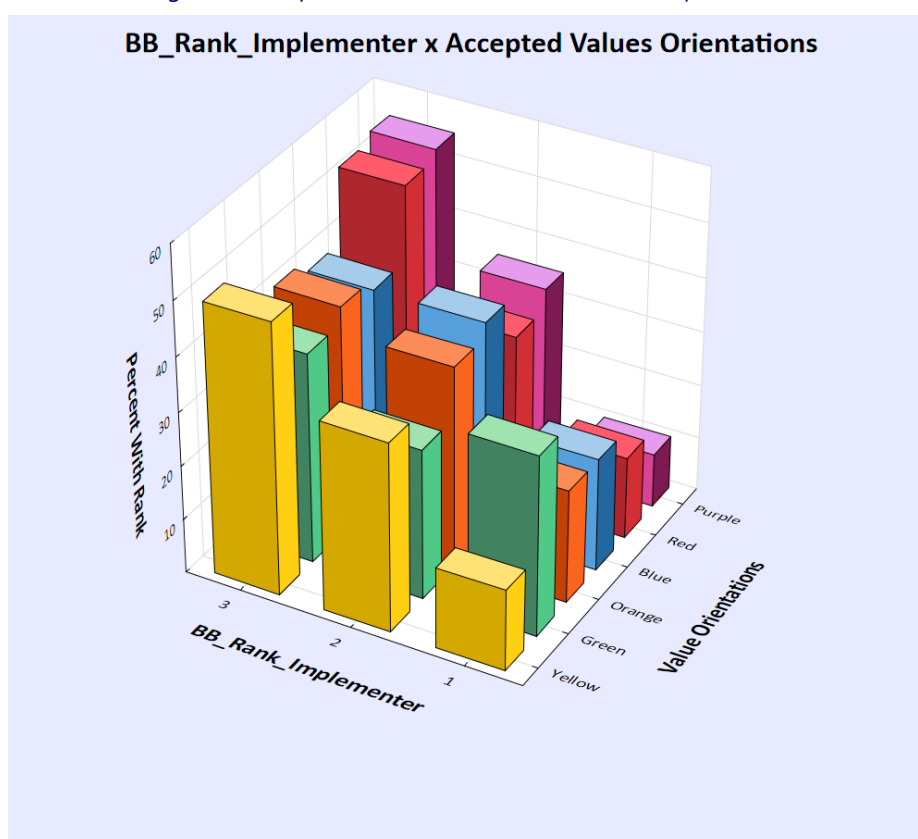
It appears that the **Purple** orientation is somewhat differentiated from the others when the Coordinator is the *secondary* role. Purple values are characterised by a strong group-orientation and a preference for working towards a common goal rather than separate goals. While the Coordinator is adept at assigning tasks to others, the amalgamation of each team member’s efforts are what the Coordinator is focused on. However it seems that individuals with Purple values are not immediately inclined to assign tasks to others as a primary role, but prefer working together first. Purple values are driven by belonging to the group, and delegating of tasks may only become necessary to ensure all team members are working together towards a shared end.

Possible negative traits associated with the Coordinator suggest a tendency to delegate so effectively that the Coordinator is left with no tasks for themselves. Negative manifestations of Yellow values can be seen in unwillingness to undertake any task that will not bring new learning, which is sometimes perceived as laziness. The negative manifestations associated with the Orange values are linked to opportunism and manipulation, which can possibly be evident in Coordinators’ behaviour in encouraging others to get things done while reaping the rewards after having offloaded their own share of the work.

Table 23: The numbers of cases associated with each selected accepted orientation, Implementer

Orientation	No. of aggregated records with a Belbin rank assigned
	20
	73
	101
	62
	18
	20
	1

Figure 23: Bivariate 3D Histogram – Accepted Values Orientations x Belbin Implementer Ranks



Once again, the **Red-Blue-Orange** combination appears to be more prominent in numbers among those who selected the Implementer role however this is attributed to the high numbers of Red-Blue-Orange values across the entire culture from which the sample is drawn.

When the Implementer is selected as a Primary role, there is slight differentiation represented by the **Green** values, however the number of candidates who actually accepted Green values was extremely small compared to the number of candidates with Blue values.

Green values: The result is surprising because Implementers are known to be slow to respond to change due to their focus on policy, procedures and all matters of a bureaucratic nature. Implementers ensure that ideas are carried out. They are not creatively inclined, but are able to take the creative ideas of other team members and fit them into existing protocol so that they can be implemented. Individuals with Green values tend to be open-

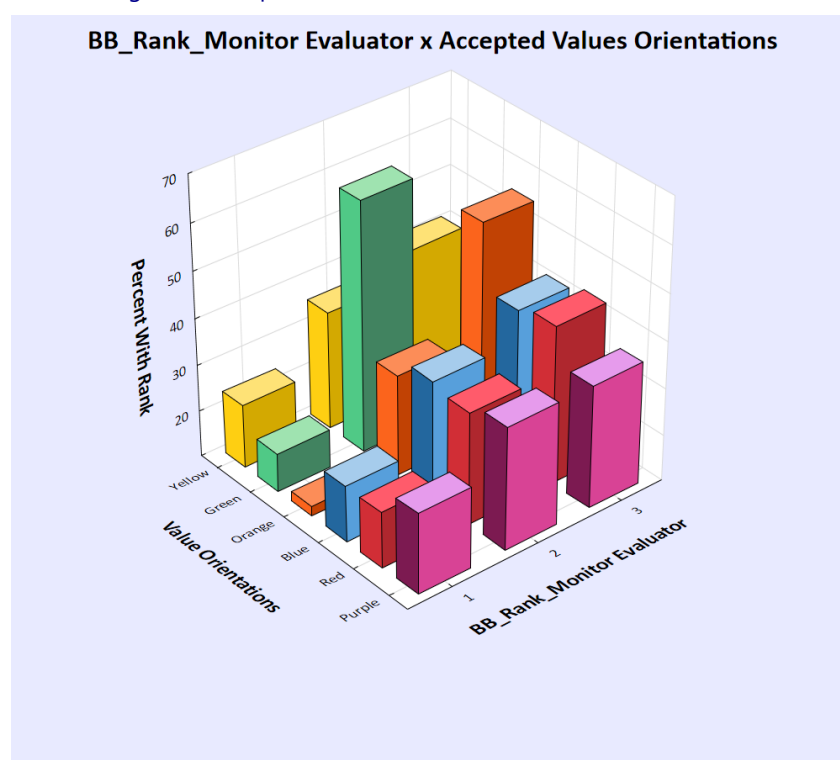
mindful, flexible and tolerant, which are not typical characteristics associated with the Implementer role. However accepting the ideas of others and helping to ensure that they are not simply left as mere ideas but actually implemented is something that fits with the compassion of Green values, as well as the practical nature of the Implementer. Green values further represent a desire to inspire others to be their best, and while the Implementer role is not driven by interpersonal aspirations, they are pragmatically motivated to make ideas happen and could indirectly be perceived as quite supportive in bringing concepts of others to manifest in reality.

As a tertiary role it appears that **Red, Purple** and possibly **Yellow** values are distinguished from the rest. Red values are primarily results-driven and after possibly taking a stronger leadership role, such candidates will want to ensure tasks are actually fulfilled. There is a strong *pragmatic* element associated with Yellow values despite the need to self-actualise and express their freedom of choice. A desire to be useful to the more creative others within the team corresponds with Purple values, following a more supportive role such as team-worker. Negative aspects of the Implementer role are associated more with the Blue values than any other, such as rigidity and being sceptical of change, which is represented by the majority of Implementers having accepted Blue values.

Table 24: The numbers of cases associated with each selected accepted orientation, Monitor-Evaluator

Orientation	No. of aggregated records with a Belbin rank assigned
	11
	41
	59
	41
	11
	17
	1

Figure 24: Bivariate 3D Histogram – Accepted Values Orientations x Belbin Monitor Evaluator Ranks



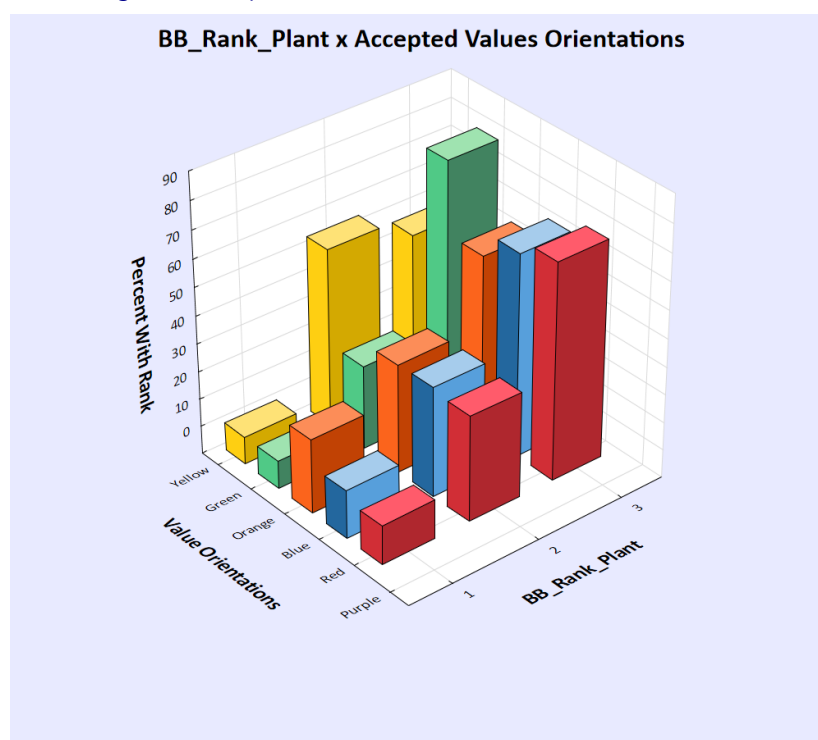
With the Monitor-Evaluator as a primary role, there is no clear differentiation among the value orientations. As a secondary role however, the **Green** values appear quite prominently. With the lower numbers in general allocated to Monitor-Evaluator, it seems that the particular sample is not heavily drawn to painstakingly analysing details to spot flaws in plans. While the overall culture of the sample seems to value quality and obtaining results (Red-Blue-Orange), the majority may be less inclined to be thoroughly pedantic in their critique of ideas. Monitor-Evaluators tend to see angles that others have not considered before, and are quick to see problems that others had not anticipated. Being critical is not typically characteristic of the Green value system however a tolerance for all possibilities and theories is a prominent attribute and this is what seems to account for the association between Green values and the Monitor-Evaluator role.

Being indecisive is a major weakness of the Green value system, and this indecisiveness is a direct result of wanting to experience every possible viewpoint of a situation. Monitor-Evaluators are less likely to be as sensitive as those who embrace Green values, but their strong desire to ensure that the ideas of the creative members cannot possibly fail is linked to the theoretical approach of the Green values. Individuals with Green values tend to hypothesise and philosophise to vast extents. Hypothesising all possible scenarios is a major characteristic of the Monitor-Evaluator, but also a desire to only endorse something that has the lowest chance of failure.

Table 25: The numbers of cases associated with each selected accepted orientation, Plant

Orientation	No. of aggregated records with a Belbin rank assigned
	6
	25
	27
	24
	10
	13
	0

Figure 25: Bivariate 3D Histogram – Accepted Values Orientations x Belbin Plant Ranks



With the Plant as a primary role, there is no clear differentiation among the value orientations except for a hint of Orange values. The Plant is the creative centre of the team, using originality to conceptualise ideas that have not been thought of by others. With the opportunity-seeking behaviour of the Orange values it is possible that such individuals are driven to think “outside the box” in order to obtain the competitive edge.

As a secondary role, the **Yellow** values appear more prominently. It seems that those with Yellow values are more inclined towards all the roles where bigger-picture thinking is required (such as Coordinator and Resource Investigator). The Plant is the most creative of the roles and aspects such as authenticity is strongly associated with both the Plant and Yellow values. Individuals with Yellow values are likely to challenge the generally accepted status quo, constantly looking beyond the detail and being somewhat detached, which allows for simplicity to be seen in complex situations. The Plant represents free-thinking and is more inclined to solve the most difficult of problems. Similarly, Yellow values are characterised by freedom of choice and an intellectual perspective which allows such individuals to see solutions that cannot be seen when preoccupied with details.

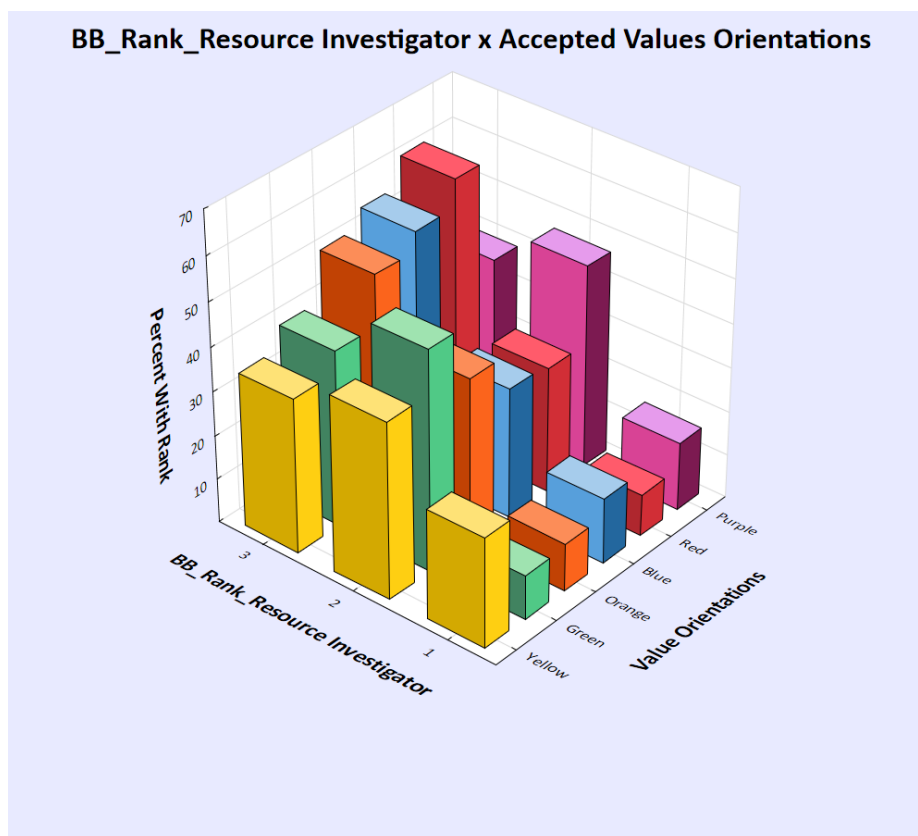
Plant roles seem to be associated with **Green** values when the role of Plant is selected as the third preference. In the entire sample the number of candidates accepting Green values was very small however there are shared qualities between the Green values and Plant team roles, such as the inherent acceptance of vastly different viewpoints and interest in theories and philosophy. Both Green and Yellow values refer to a more broad-minded perspective, higher levels of consciousness and striving for more than bottom-line results.

Negative characteristics associated with both the Plant role and the Yellow values are that such individuals tend to ignore minor details which could have major implications. The Plant role also implies in-depth thinking about certain topics, which may cause emotional detachment from others, something that is strongly associated with Yellow values too.

Table 26: The numbers of cases associated with each selected accepted orientation, Resource Investigator

Orientation	No. of aggregated records with a Belbin rank assigned
	13
	42
	54
	37
	20
	20
	0

Figure 26: Bivariate 3D Histogram – Accepted Values Orientations x Belbin Resource Investigator Ranks



When the Resource Investigator was selected as the primary role, only the **Yellow** values were slightly elevated. The Resource Investigator is the other creative role however unlike the Plant this role is more extraverted, communicative and enthusiastic.

The **Yellow** values seem to be associated with both creative roles, largely because of the independent-minded perspective, flexibility and preference for looking at the whole picture rather than the details. What makes the Resource Investigator different to the Plant is that the Investigator does not necessarily turn inwards for creative inspiration, but explores external resources. This still fits within the big-picture Yellow framework. The Investigator is adept at identifying areas that have not been tapped before, with seemingly endless lists of contacts that can be called upon for virtually any type of dilemma. Although the Yellow value system is characterised by an intellectual approach, there is also a very strong pragmatic orientation, where simplicity is key in seeing practical solutions without the added complexity of minute details. Looking beyond the ordinary solutions, the Resource Investigator is not likely to run out of options.

The **Purple** and **Green** values also appear to be fairly strongly related to this role as a secondary preference. Both the Purple and the Green values are very much socially-oriented value systems, which support the outgoing Investigator role. The networking aspect of this role makes the Investigator unique in their creativity, and is further supported by the Purple values (striving for group belonging and relating to others more frequently than relating to self) and the Green values (driven to connect with other people).

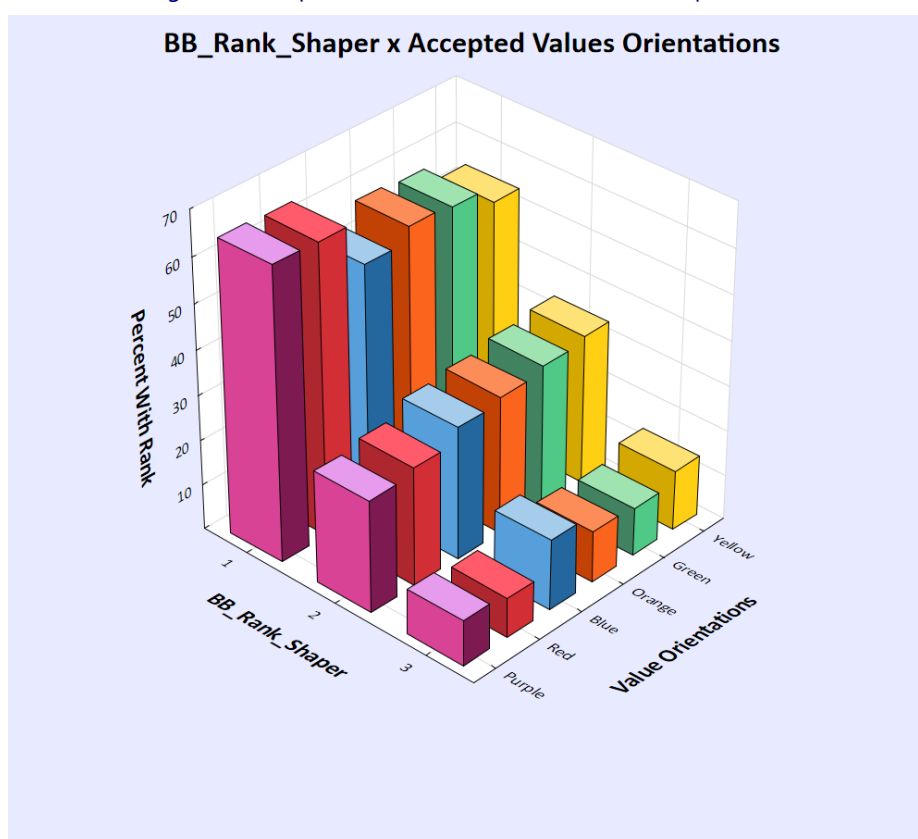
A major negative attribute associated with both the Yellow values and the Resource Investigator is the tendency to be enthusiastic in the early stages and then losing interest without seeing a project through. The Yellow values are particularly driven by learning in order to self-actualise. If such individuals perceive that learning is no longer taking place, motivation drops.



Table 27: The numbers of cases associated with each selected accepted orientation, Shaper

Orientation	No. of aggregated records with a Belbin rank assigned
	20
	102
	135
	88
	28
	30
	3

Figure 27: Bivariate 3D Histogram – Accepted Values Orientations x Belbin Shaper Ranks



When the Shaper is presented as the Primary role, there does not appear to be strong differentiation among the value systems. With the high necessity for being results-driven within the sample (mining; engineering and security sectors), it appears that very different internal drives (values) can still be expressed or manifested in a highly goal-oriented manner with a sense of urgency. The Shaper role shows a predominating aspiration to prevent complacency and drive others towards goals. With the dominant culture of the sample population being focused on bottom-line results, the majority of this sample seems to have adopted the Shaper as their primary role. The monotonic trend shows that across all 6 value systems (which excludes Turquoise values), the highest percentage of acceptance occurs when the Shaper is the primary role, and decreases with the secondary and tertiary roles respectively.

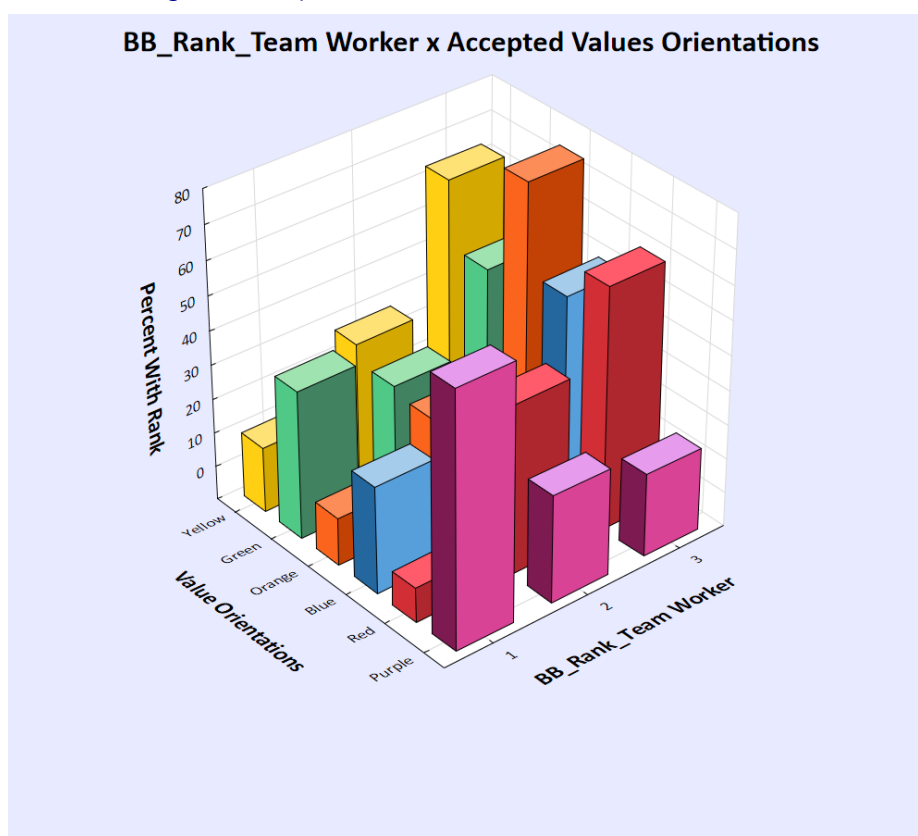
It appears that even though each value system is motivated by different things (e.g. money and status versus humanitarian concerns), if they are strongly driven towards their values, their focus may be enhanced in different

ways by the Shaper role. Once again, the Red-Blue-Orange combination is most prominent in numbers and corresponds with the active goal-setting and resolve associated with the Shaper.

Table 28: The numbers of cases associated with each selected accepted orientation, Team Worker

Orientation	No. of aggregated records with a Belbin rank assigned
	14
	33
	61
	25
	18
	11
	2

Figure 28: Bivariate 3D Histogram – Accepted Values Orientations x Belbin Team Worker Ranks



When the Team Worker was selected as the primary role, it appears that the **Purple** and **Green** are distinguished (along with the **Blue** values to some extent).

All three of these value systems are associated with the more group-oriented and somewhat sacrificial side of the spectrum. People accepting the Purple value orientation are strongly driven by in-group belonging, those with Green values are driven by compassion and sensitivity while those with Blue values are likely to be very supportive in adhering to a moral compass as well as being reliable and trustworthy. All three of these value systems suggest individuals who would rather blend in with a group than be frontrunners themselves. Similarly, the Team Worker

role captures the interpersonal sensitivity of these value orientations and corresponds particularly well with the Purple and Green orientations.

The Team Worker is attuned to intangible dynamics within the team and is likely to encourage harmony among team members (Green). Also, the Team Worker is more likely to emphasise working together in unity rather than emphasising individual achievements (Purple).

When the Team Worker was selected as the *third* role, there appears to be some differentiation among the **Orange** and **Yellow** value systems, which are typically more individualistic. The Orange values are primarily characterised by opportunity-seeking behaviour, and therefore showing some interpersonal sensitivity is likely to promote more of the “win-win” situations that drive those with Orange values (even if it manifests in a somewhat manipulative way).

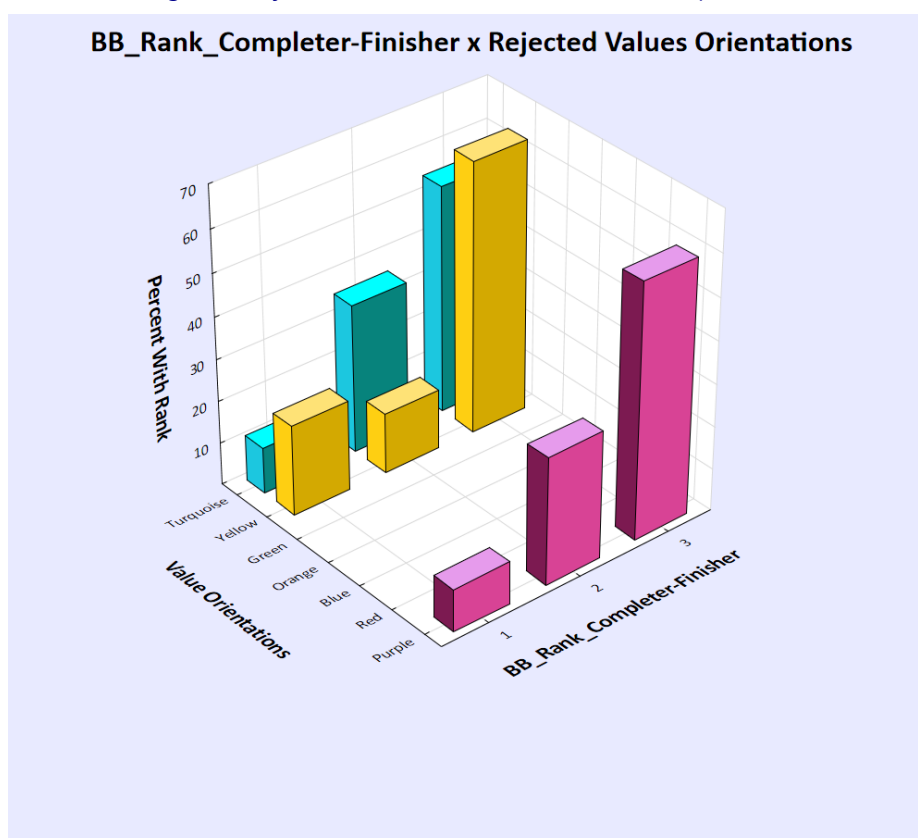
The Yellow values are extremely individualistic, however the flexibility inherent in this approach allows such individuals to take on varying roles, depending on what the situation requires. As part of a continual learning process, it seems that those with Yellow values are also likely to understand the worth that an empathic and supportive attitude has as part of the entire system. Even though those with Yellow values may be more emotionally detached in order to see the bigger picture, they are likely to supplement their personal learning by working with others.

### 3.2 Sequential Bivariate Histograms – Selected Rejected Orientations

Table 29: The numbers of cases associated with each selected rejected orientation, Completer-Finisher

Orientation	No. of aggregated records with a Belbin rank assigned
	10
	5
	1
	2
	2
	14
	37

Figure 29: Bivariate 3D Histogram – Rejected Values Orientations x Belbin Completer-Finisher Ranks



Of the individuals selecting the Completer-Finisher role as the primary role, it appears that the rejection of only three value systems is significant. The **Turquoise** value system seems to be rejected consistently across the entire sample, regardless of the Belbin Team role selected.

Turquoise values are largely associated with a transcendent approach, where self-centred concerns become meaningless and a deeper connection is pursued. Such an approach may be described as spiritual but the rejection thereof does not equate a lack of spirituality. Rather, the rejection of this value system is associated with a more pragmatic perspective, which appears to be representative of the dominant culture of the sample.

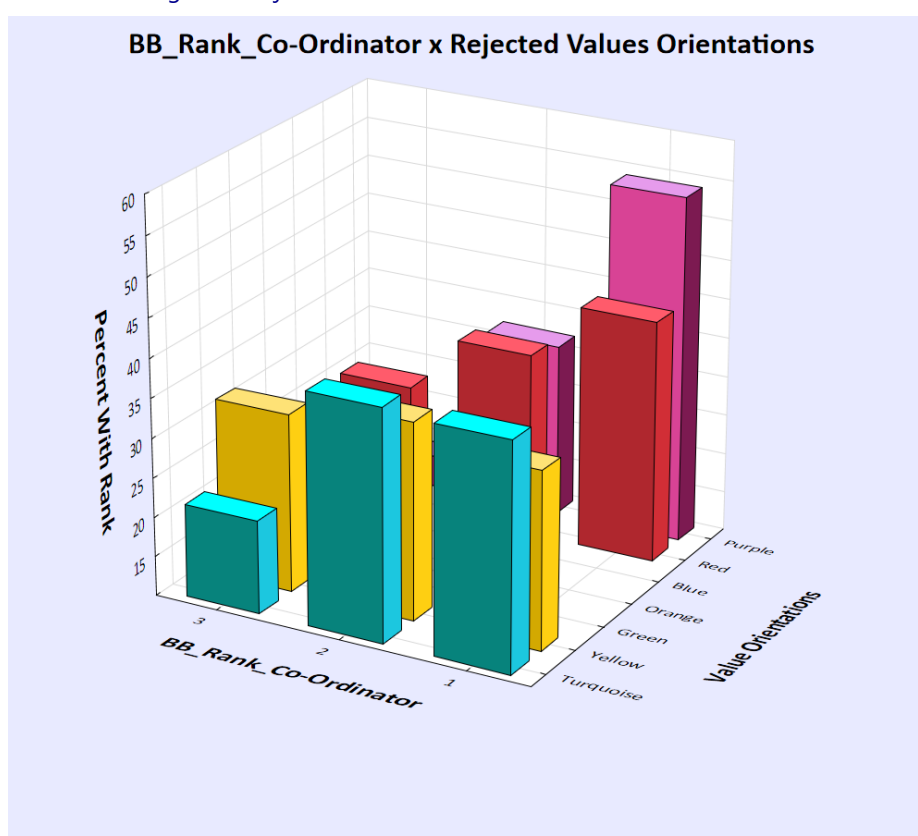
Turquoise values are further characterised by a holistic perspective, and the precision-driven Completer-Finisher is not likely to embrace such an abstract approach where concrete reality becomes obscured by the seeking of a deeper meaning beyond the details.

Yellow and Purple values are also rejected by individuals selecting the Completer-Finisher role (but to a lesser extent than the Turquoise values). Yellow values are focused more on systems thinking rather than details, while Purple values emphasises team work. Completer-Finishers are strongly resistant to sharing work with others and thus inclined to reject the Purple values.

Table 30: The numbers of cases associated with each selected rejected orientation, Coordinator

Orientation	No. of aggregated records with a Belbin rank assigned
	50
	27
	0
	6
	2
	40
	165

Figure 30: Bivariate 3D Histogram – Rejected Values Orientations x Belbin Coordinator Ranks



For those selecting the Coordinator role, it appears that **Turquoise** again represents the highest number of rejected values. This appears to be due to the sample's culture being primarily results-oriented, pragmatic and

driven to perform rather than leaving the world of work to experience cosmic connection. However, as a *primary* role, it appears that the **Purple** values show stronger differentiation in terms of a rejected orientation.

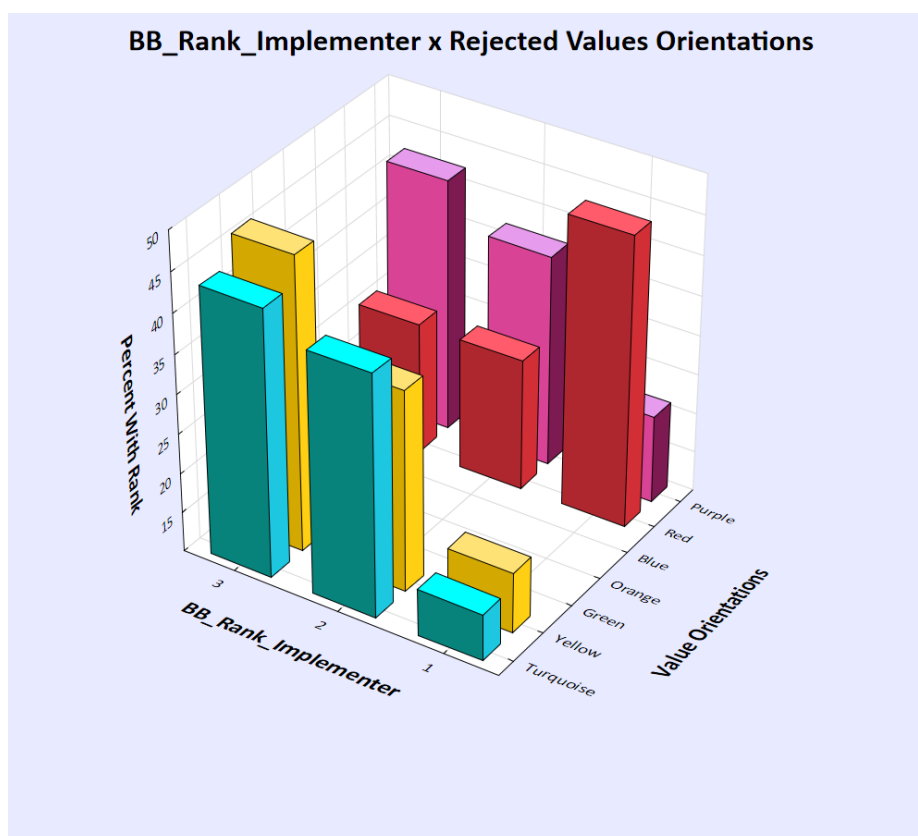
The negatives of the Purple orientation are associated with in-group bias and traditional-based decision-making. The Coordinator is typically a leadership role, encouraging individual strengths in each team member. Coordinators are unlikely to be interested in favouring certain team members based on their group-belonging. Also, this role is associated with working with the whole system (the team) and therefore suggests bigger-picture thinking as opposed to following customary practices.

Overall, the entire sample seems to consistently reject Turquoise, Yellow and Purple values, owing to the practical nature of their work, as well as a more individualistic approach where group belonging (Purple) seems less prized.

Table 31: The numbers of cases associated with each selected rejected orientation, Implementer

Orientation	No. of aggregated records with a Belbin rank assigned
	38
	15
	1
	5
	3
	34
	126

Figure 31: Bivariate 3D Histogram – Rejected Values Orientations x Belbin Implementer Ranks



Once again, the Turquoise values appear to have been rejected by the highest number of those who have selected the Implementer role. However, as a *primary* role, it appears that the **Red** values show stronger differentiation in terms of a rejected orientation, but the actual number of individuals rejecting Red is very low.

Implementers are exceptionally pragmatic, constantly striving to ensure that ideas are carried out in the most reliable way. Therefore obscure thinking is not desirable to such individuals, resulting in the rejection of both Yellow and Turquoise values. Rejection of Red values suggests an avoidance of a domineering approach brought about by a scarcity mentality. Implementers are less likely to pursue goals out of fear that others will get to them first. A major weakness of the Implementer is described as being slow to respond to possibilities, thereby rejecting the urgency of the Red values to pursue objectives, but rather wanting to steadily convert ideas into reality without being forceful or domineering.

The Turquoise, Purple and Yellow values are consistently rejected due to the overall sample culture.

Table 32: The numbers of cases associated with each selected rejected orientation, Monitor Evaluator








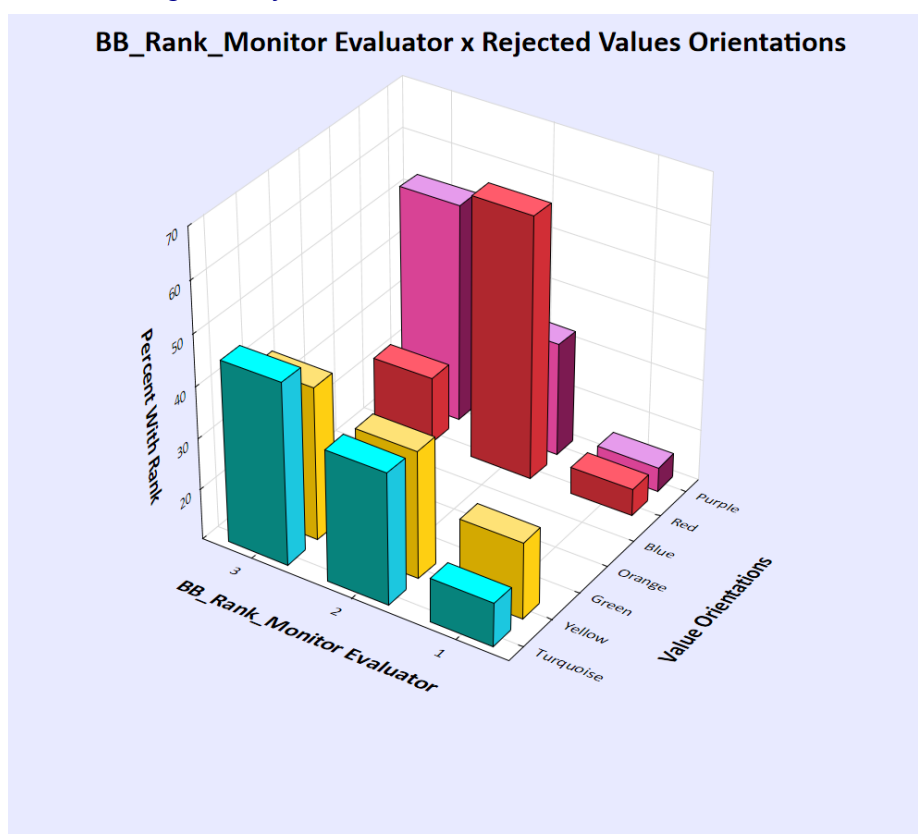
Orientation	No. of aggregated records with a Belbin rank assigned
	34
	13
	1
	1
	1
	20
	81

Figure 32: Bivariate 3D Histogram – Rejected Values Orientations x Belbin Monitor Evaluator Ranks

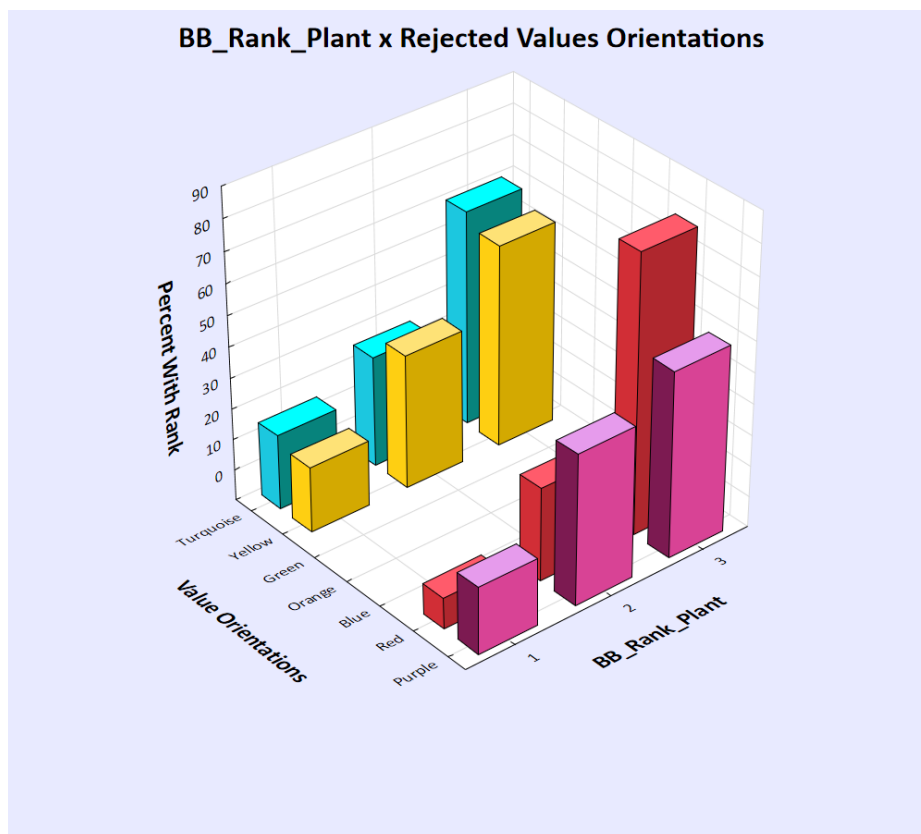


Of those with the Monitor Evaluator role, the majority seemed to reject the Turquoise value orientation due to its abstract and evidence-scarce approach. Although the Red values seem to show strong differentiation in the secondary role, the number of those rejecting red is so low it may not be particularly noteworthy.

Table 33: The numbers of cases associated with each selected rejected orientation, Plant

Orientation	No. of aggregated records with a Belbin rank assigned
	26
	10
	0
	3
	0
	9
	35

Figure 33: Bivariate 3D Histogram – Rejected Values Orientations x Belbin Plant Ranks



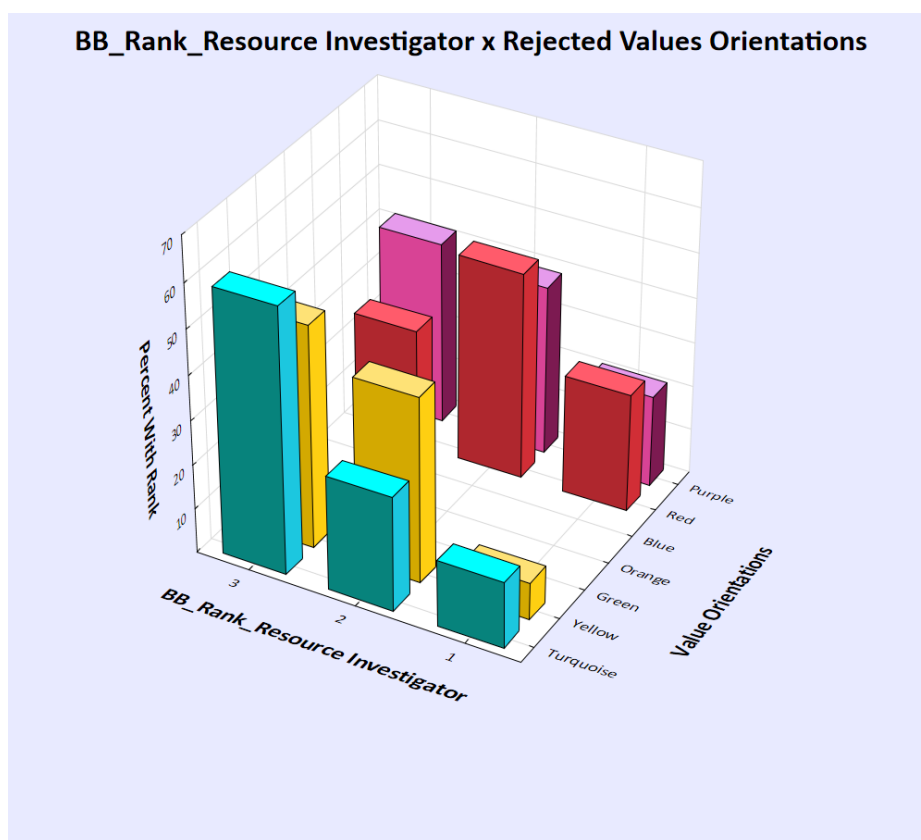
The sample's overall rejection of the Turquoise values is reflected again among the individuals that selected the Plant role. The rejection of the Purple values is almost as prominent in numbers, possibly a result of the Plants favouring original thinking over mass mentality.



Table 34: The numbers of cases associated with each selected rejected orientation, Resource Investigator

Orientation	No. of aggregated records with a Belbin rank assigned
	34
	15
	0
	2
	3
	24
	74

Figure 34: Bivariate 3D Histogram – Rejected Values Orientations x Belbin Resource Investigator Ranks

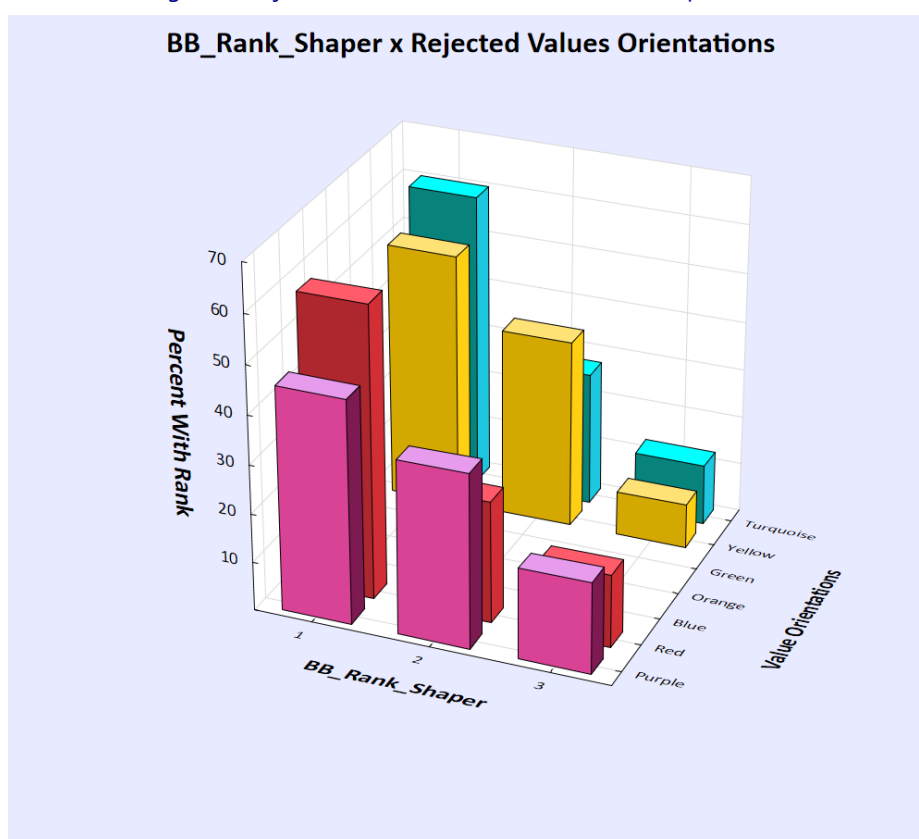


The Turquoise values appear to have been rejected by the highest number of those who have selected the Resource Investigator role. There is no clear differentiation as a primary role.

Table 35: The numbers of cases associated with each selected rejected orientation, Shaper

Orientation	No. of aggregated records with a Belbin rank assigned
	59
	20
	1
	5
	3
	44
	176

Figure 35: Bivariate 3D Histogram – Rejected Values Orientations x Belbin Shaper Ranks

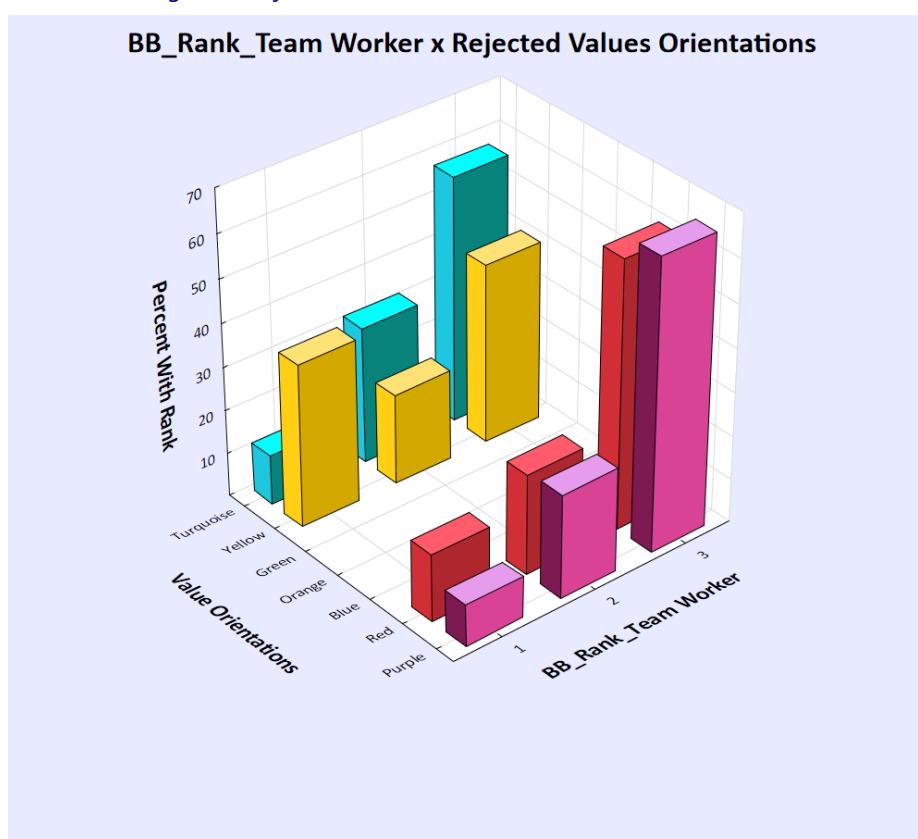


More than half of the individuals that selected the Shaper team role seem to reject the Turquoise world view. Driving the team towards objectives with a sense of urgency is a trait that is unlikely to correspond with a transcendent, immaterialist worldview. There does appear to be a monotonic trend, suggesting the strongest rejection of Turquoise, Yellow, Red and Purple values when the Shaper is selected as the primary role, lowered levels of rejection as the secondary role and still lower levels of rejection in the tertiary role for all four worldviews. It seems that the highest number of individuals within the sample selected the Shaper role, resulting in the accepted values being spread amongst all the worldviews except the Turquoise one.

Table 36: The numbers of cases associated with each selected rejected orientation, Team Worker

Orientation	No. of aggregated records with a Belbin rank assigned
	21
	13
	0
	7
	1
	24
	70

Figure 36: Bivariate 3D Histogram – Rejected Values Orientations x Belbin Team Worker Ranks



It appears that the majority of those who selected the Team Worker role reject the Turquoise values. There is some differentiation among the Yellow values when the Team Worker was selected as the primary role. Those who are more group-oriented tend to view those with Yellow values as being selfish and driven only by endeavours that will enhance their personal experience. Those with Yellow values are perceived as being emotionally-detached, unreliable and disinterested in working together towards common goals. The rejection of Purple (group orientation) shows a monotonic trend, being increased as the role becomes less important. The sample as a whole seems to reject Purple, however it is less pronounced among the individuals who are primarily team workers.

## 4. Selected Values Orientations and CPP Attributes

Both sample 1 and 2 provided data on VO orientation selections and CPP attributes. The initial analyses compared the association between Selected VO orientations and CPP variables, using the same approach as for the MBTI and Belbin. For example, for Current Level of Work, we plot the percentage scored with a particular CPP Current Level of Work for each VO orientation. That is, for each colour orientation, the number of people assigned a particular Level for each Current Level of Work is expressed relative to the total number of Levels associated for that particular colour *{only levels 1-4 were assigned in both samples, the highest level = 4}*. We then create a three-dimensional bivariate histogram which incorporates each of the values orientation histograms for the CPP attribute. In this way, any trends in the respondent patterns of accepted or rejected orientations for any particular CPP attribute can be easily discerned. As before, because up to three accepted values orientations can be selected for an individual, based upon that individual's responses, the histogram data represent the observed CPP data associated with an orientation, irrespective of whether it was selected as a 1<sup>st</sup>, 2<sup>nd</sup>, or 3<sup>rd</sup> selected orientation. For example, if an individual possesses three selected orientations of Red, Green, and Blue, and a Current Level of Work of 3, then their 'record' is expanded into three cases in the data file presented to the histogram analysis:

- Red = CPP Level of Work: 3
- Green = CPP Level of Work: 3
- Blue = CPP Level of Work: 3

The same input data-file construction approach is taken for the selected rejected orientations, where up to two rejected orientations may be selected for an individual.

Where there are less than 10 observations for an orientation, that orientation is excluded from the bivariate histograms.

### 4.1 Current and Potential Level of Work

Performance on the CPP can, in addition to cognitive styles, be interpreted in terms of the Levels of Work complexity an individual can deal with cognitively. The Level of Work component reflects the work of Elliot Jaques (SST) and Stafford Beer (VSM). In the CPP, one of up to 5 Levels of Work are reported for a respondent:

#### 1. A Purely Operational environment

People who are suited to the Operational work environment prefer direct involvement with practical, clearly-structured operating tasks that have obvious and clear rules for success – for example, answering the phone and taking a customer's order correctly. They deal with routine, concrete tasks that have clear linear procedures, using their knowledge to complete the task – for example, following a step-by-step software program to reorder stock items. They like the information they work with to be tangible and definite (with no ambiguity), and they deal with problems one by one as they crop up, usually by coming up with practical solutions. They prefer to work in a familiar environment that has well-defined rules and structures. When learning new tasks, these people may use a trial-and-error approach, and are likely to want to explore issues practically and seek short-term feedback to confirm that they are on the right track. Examples of roles reflecting the Operational work environment are customer services, retail, clerical and administrative staff (depending on their position), manual labourers and those who do routine jobs such as working on a production line, maintaining equipment, etc.

#### 2. A Diagnostic Accumulation environment

People who are suited to the Diagnostic work environment may have an analytical / sequential approach, following clear, linear procedures to diagnose and solve problems that are not always obvious. They do this by using their existing knowledge and experience together with theoretical knowledge to interpret information (such as symptoms), and by asking either/or questions to help them decide how to solve the problem. Such people often have specialist or good technical knowledge in their field. For example, a nurse has solid technical

knowledge, yet will need to ask a patient questions to reach a correct diagnosis. A specialist motor mechanic will also use practical experience and theoretical knowledge to determine why a car has broken down and how to best fix it. People who reflect the Diagnostic work environment are often first-line managers, dealing with people face-to-face and supervising those who perform direct operating tasks. Those preferring this type of work environment tend to learn by capitalising on memory of their theoretical / specialist knowledge base and practical experience. Examples of roles reflecting the Diagnostic work environment are lab technicians, shop managers, emergency service staff, interior designers, food technologists, air traffic controllers, dentists, sales staff, teachers and most other technical or supervisory positions.

### **3. An Alternative Paths environment (Tactical Strategy)**

These people tend to evaluate systems and practices, make practical decisions about the best way to get things working efficiently, and plan how resources can be deployed optimally. They also thoroughly think things through and have contingency plans in place should things go wrong. Operational efficiencies, benchmarking and cost are important factors. They often come up with short-term solutions that pave the way for longer-term achievement. Learning takes place via systematic experimentation with different operational systems and structures, as well as through transfer and application of theoretical angles. Middle and senior managers often work within the Tactical work environment, as do certain professionals and specialists. In certain industries, general management also reflects a Tactical focus. As is the case with the Operational and the Diagnostic levels, the Tactical work environment entails working within one system or functional unit (rather than working across various systems). However, the information dealt with on this level tends to be complex and abstract, with the focus on meaningful wholes, systems and plans. Moreover, the goals are not clearly defined. Examples of roles reflecting the Tactical work environment are doctors, lawyers, company secretaries, financial advisors, project managers, chief engineers and departmental or business unit managers. To be specific, a Tactical manager at a publishing company may be required to create a well-organised operating system to publish a book: commissioning an author, having the book and cover designed, proofed and printed, organising PR and marketing, distributing the book to retailers.

### **4. A Parallel Processing environment**

People who are suited to Parallel Processing environments enjoy working both within and across relatively complex systems – for example, coordinating the activities of several business units in a large organisation. They tend to focus on both broad strategy and the operational implications of the strategic direction taken. They often focus on abstract, intangible issues – theories, models, viability of projects / programmes – and come up with creative, integrated, and abstract conceptual solutions. Such people plan and implement business solutions, balancing and juggling resources between different projects and programmes so that these are used most effectively, and that equally important demands of each project are met. People who function within a Parallel Processing environment normally work on programmes with time scales of three to five years. They often deal with broad strategy, the long term viability of the business, value chain integration, organisational change / transformation. As specialists, they tend to focus on and create new functionalities. They often learn via an innovative, integrative systems approach by synthesising various abstract theoretical options into a model. Such models are then used to guide operational issues, to monitor consequences and to make the necessary adaptations. (Both Level 4 & 5 SST). Examples of roles reflecting the Systems-focused work environment are software architects, business analysts, general managers, senior professional/specialist positions within an organisation.

### **5. A Purely Strategic environment**

The work associated with the Strategic environment involves big picture systems thinking. New relationships are sought between previously unrelated concepts, new rules are formulated and new systems and knowledge fields are shaped in the process. In terms of cognitive functioning, these individuals often consciously evaluate and decide on the most appropriate level of analysis (ranging from concrete to abstract), identify vaguely emerging opportunities within a somewhat chaotic environment, clarify this fuzzy information, and show awareness of business and moral / ethical implications for the industry. They primarily tend to capitalise on intuitive awareness

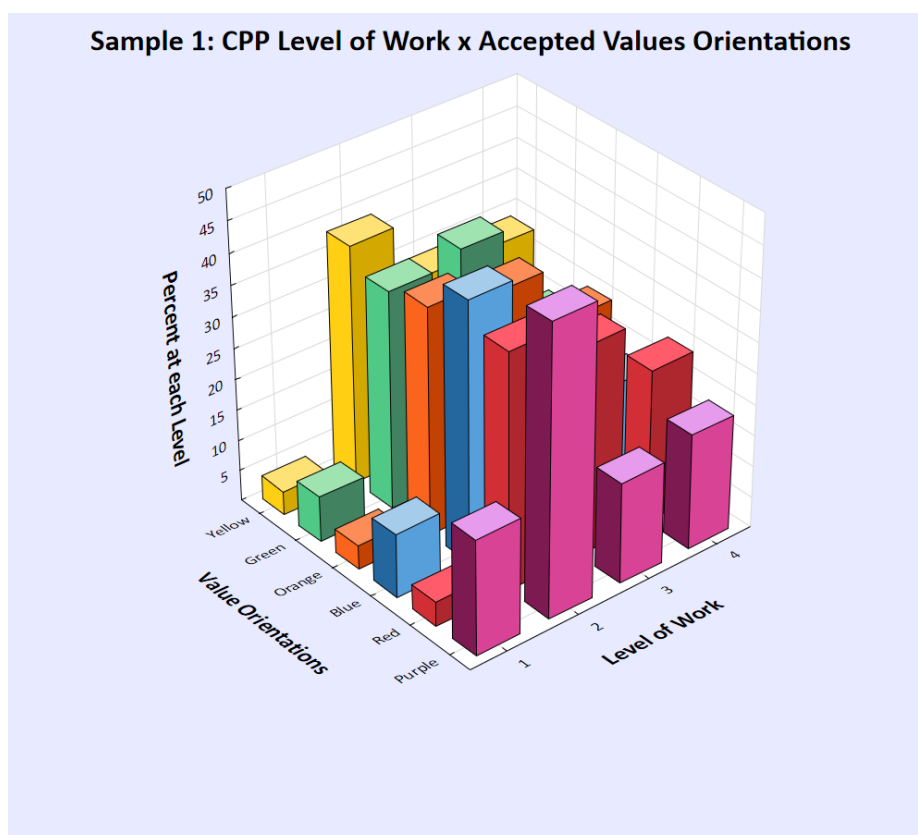
– more so than on logical details. They often initiate change that may impact the whole industry and create a future through philosophical leverage. They deal in long term frames – usually five to eight years and sometimes even longer. They prefer to work with abstract, broad, sweeping issues – chaos, macro-economic factors, potential industry partners and environmental impacts. Operations of a truly Strategic nature will involve the creation of unified whole systems, such as national or international businesses, focusing on renewal through exploring new philosophical trends and intuitively sensing connections between seemingly unconnected variables, i.e. industry partners. Examples of Purely Strategic work can be found amongst certain entrepreneurial initiatives, thought leadership, political and economic forecasting, and roles such as chairpersons and directors of national and multi-national companies.

#### 4.1.1 Accepted Orientations

Table 37: Accepted Orientations x CPP Current Level of Work designations [1-4], Sample 1

Orientation	No. of aggregated records with a Current Level of Work
	43
	150
	213
	128
	54
	52
	5

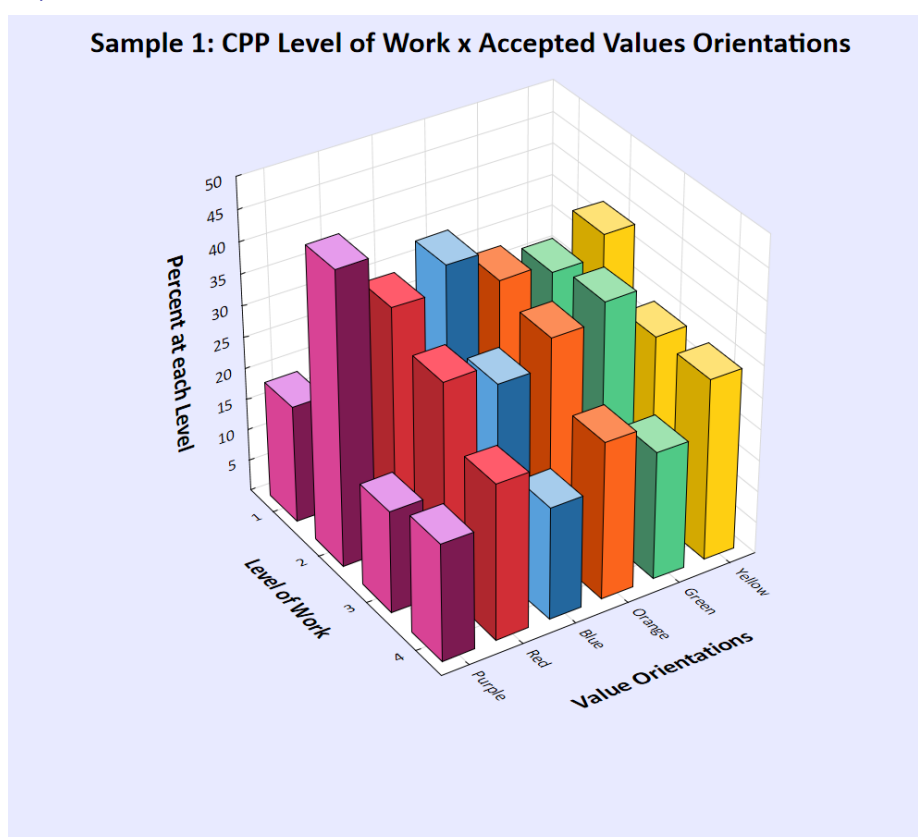
Figure 37: Bivariate 3D Histogram – Accepted Values Orientations x CPP Current Level of Work, Sample 1



It is worth mentioning again that the group sample's job-roles span across senior management and C-suite executive roles, within industrial-production, infrastructure and security job-sectors. The requirements of the jobs are thus related to higher level of complexity.

It can be observed that the greatest presence of all VO colours is evident at the Diagnostic Accumulation (2) Level of Work (LoW). Although this environment is technical/knowledge-driven in nature, it can encompass different types of work (from task-oriented analyst to people-oriented psychologist) which would incite the existence of a variety of worldviews. Tactical Strategy (3) LoW seems to be more associated with Red, Orange and Green orientations, as such an environment is related to direct management and action-orientation. Lastly, Parallel Processing (4) LoW is mainly Yellow on VO as the focus is more on broad strategy and abstract and dynamic elements.

Figure 38: Bivariate 3D Histogram – Accepted Values Orientations x CPP Current Level of Work, Sample 1 (alternative perspective)



From the alternative perspective, it can be seen that the major difference in Current Level of Work assignment is between those whose selected orientation includes the Purple orientation, and others. The clear majority of the selected accepted Purple orientation observations are associated with a Current Level of Work index of 2, which is focused on guidelines, certainty and externally imposed structure. Blue colour also features mostly in relation to LoW 2. The rest of value orientations seem more evenly spread.

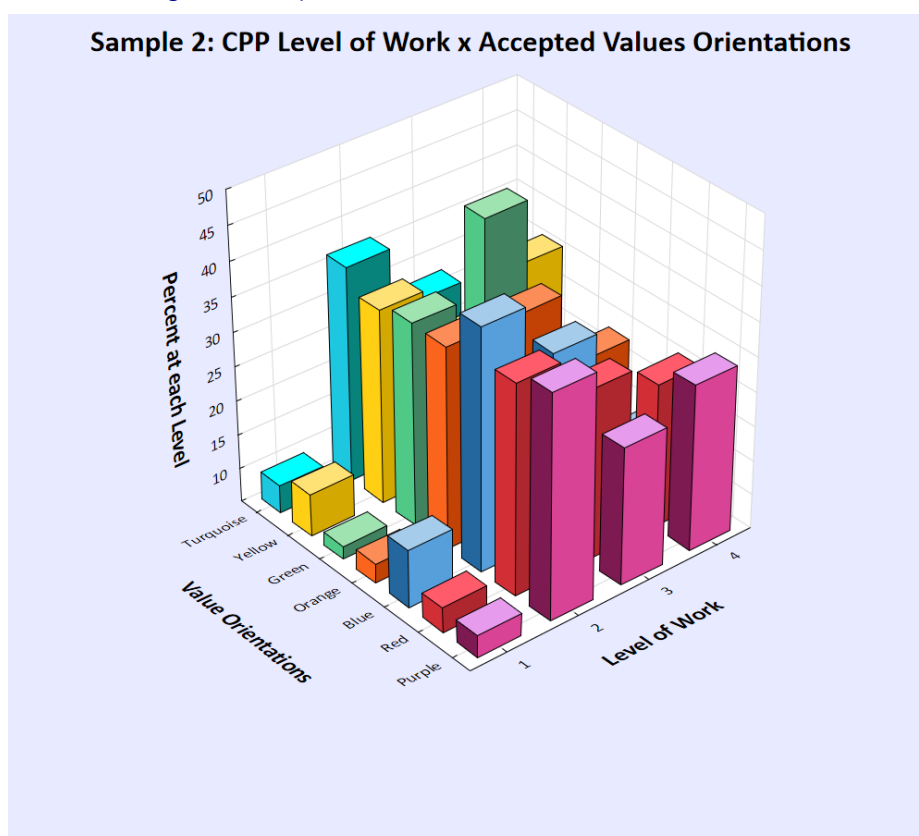
Similarly for Sample 2's data:

Table 38: Accepted Orientations x CPP Current Level of Work designations [1-4], Sample 2

Orientation	No. of aggregated records with a Current Level of Work
	24
	104
	97
	102
	29
	45
	11

With the corresponding bivariate histograms, looking very similar to those for Sample 1.

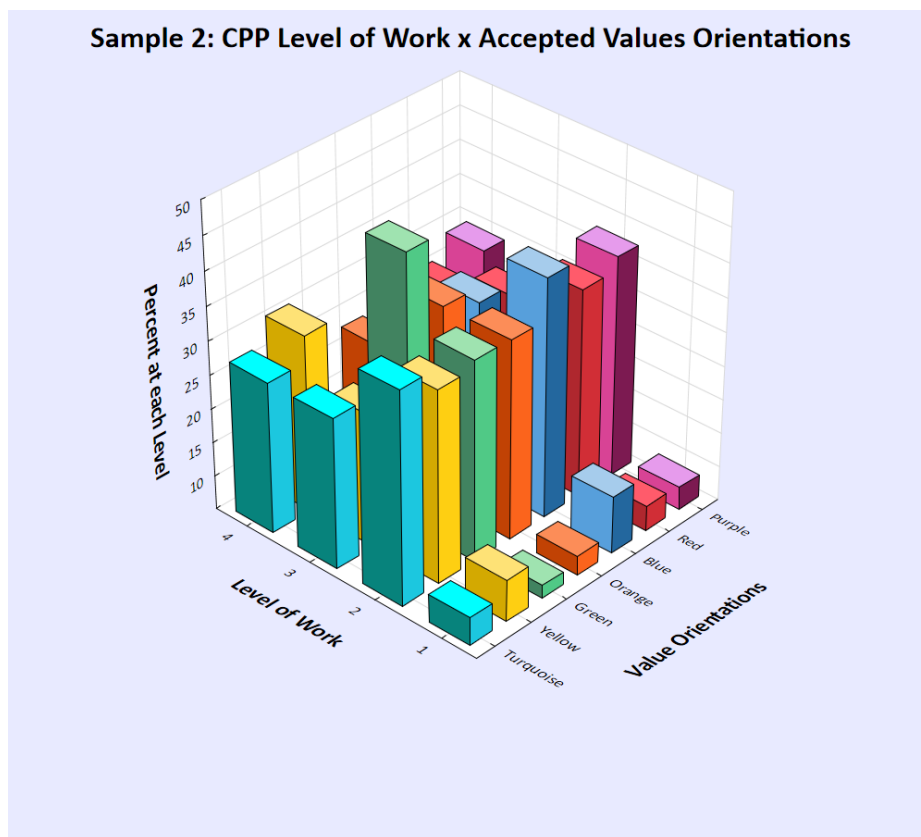
Figure 39: Bivariate 3D Histogram – Accepted Values Orientations x CPP Current Level of Work, Sample 2



Although Sample 2 is smaller in numbers than Sample 1, the job roles are relatively similar and the results seem to correspond with Sample 1 graphs. The value orientations are evenly spread within Diagnostic Accumulation (2) LoW. Orange and Green values are prominent at Tactical Strategy (3) LoW, while Yellow orientation seems to be the predominant one within Parallel Processing (4) LoW.



Figure 40: Bivariate 3D Histogram – Accepted Values Orientations x CPP Current Level of Work, Sample 2  
(alternative perspective)



It is interesting that Green value orientation is most prominent at LoW 3. It may be associated with the fact that LoW 3 is concerned with direct management of a variety of views and skills, hence cooperation and tolerance of different perspectives is crucial. As in Sample 1, Purple and Blue seem to show higher scores in relation to LoW 2.

Figure 41: Bivariate 3D Histogram – Accepted Values Orientations x CPP Potential Level of Work, Sample 1

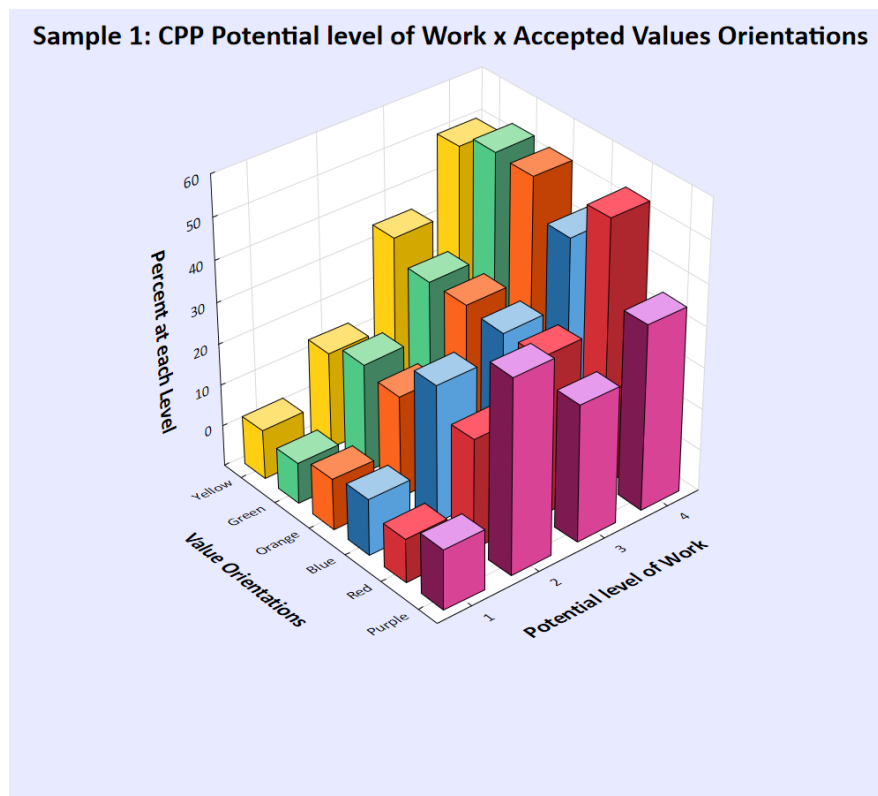
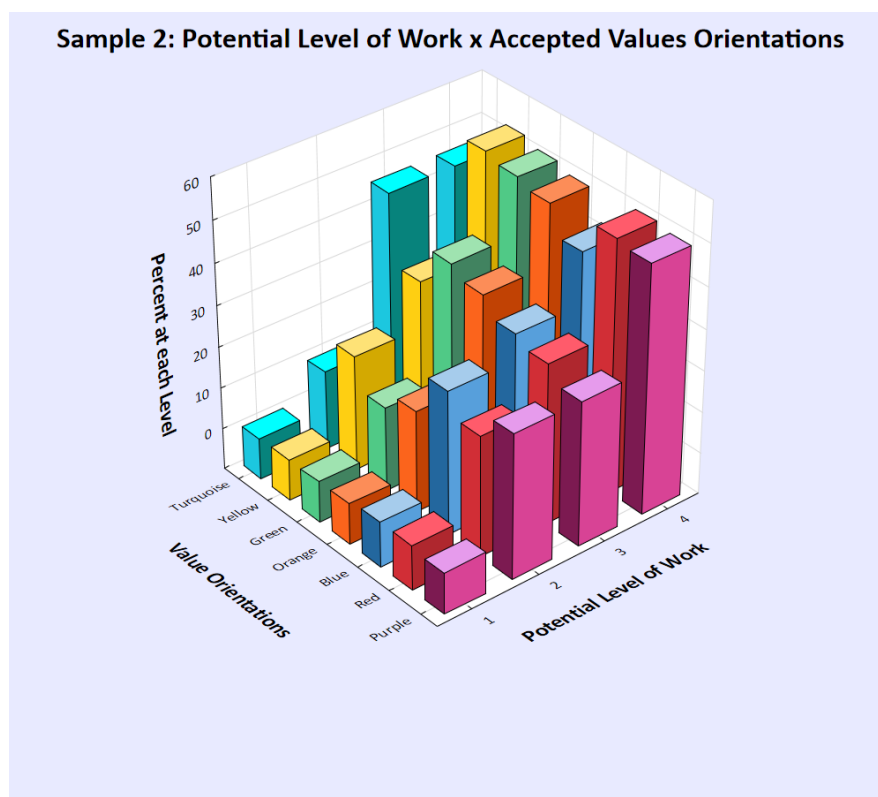


Figure 42: Bivariate 3D Histogram – Accepted Values Orientations x CPP Potential Level of Work, Sample 2



The data for both samples shows the same increasing trend toward a higher potential level of work across all accepted orientations. Although value orientation can influence one's current comfort with complexity (current

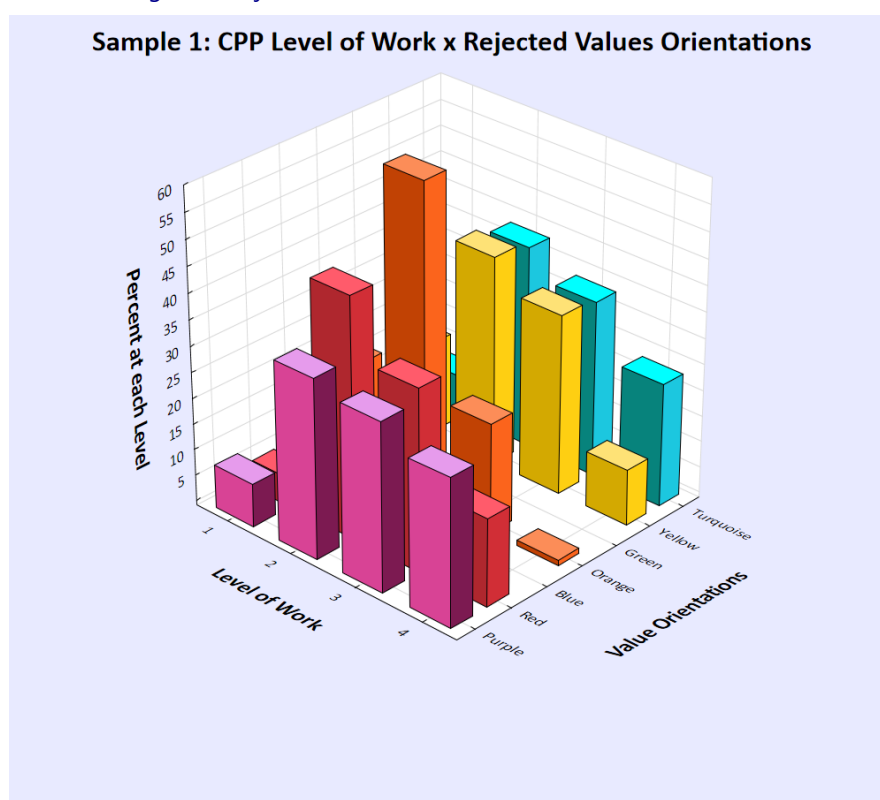
Level of Work), it doesn't limit one's potential to deal with greater complexity. The potential does not depend on one's worldview.

### 4.1.2 Rejected Orientations

Table 39: Rejected Orientations x CPP Current Level of Work designations [1-4], Sample 1

Orientation	No. of aggregated records with a Current Level of Work
	95
	44
	1
	10
	6
	71
	277

Figure 43: Bivariate 3D Histogram – Rejected Values Orientations x CPP Current Level of Work, Sample 1

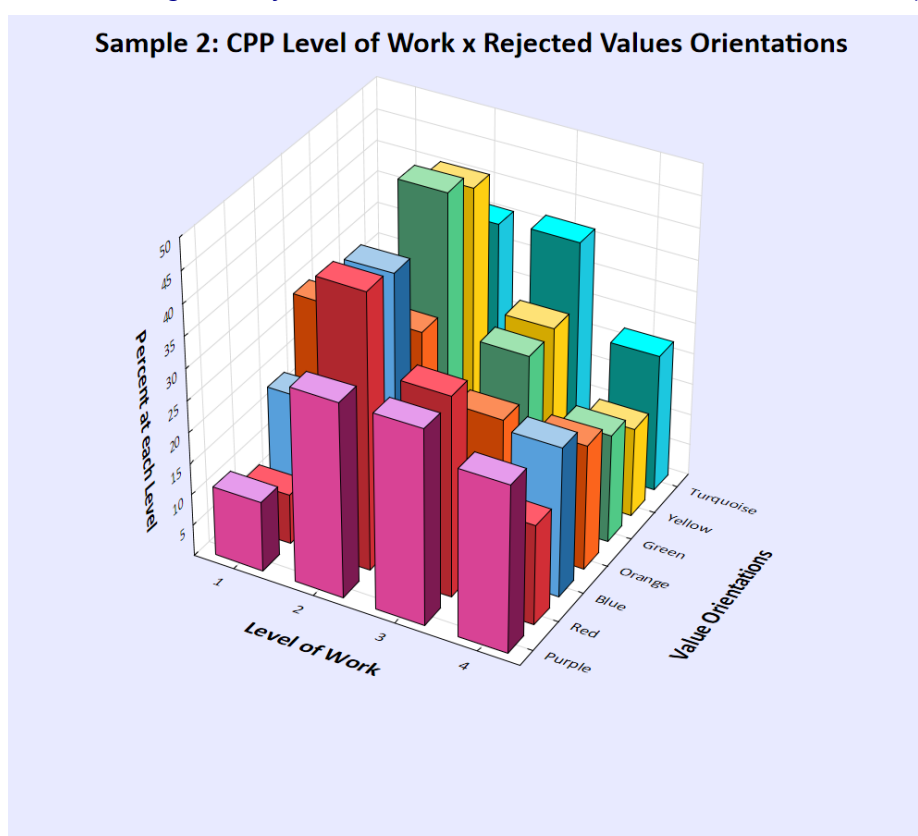


Worth-mentioning is that rejection of Orange value orientation seems to be mostly related to Diagnostic Accumulation (2) LoW. However, the number of individuals who rejected Orange may be too small to interpret it meaningfully in relation to other value orientations.

Table 40: Rejected Orientations x CPP Current Level of Work designations [1-4], Sample 2

Orientation	No. of aggregated records with a Current Level of Work
	90
	25
	21
	10
	23
	49
	132

Figure 44: Bivariate 3D Histogram – Rejected Values Orientations x CPP Current Level of Work, Sample 2



In Sample 2 greatest rejection of Green and Yellow is present at LoW 2. This could be related to the fact that these individuals prefer guidelines, certainty, boundaries and linear processes (less complexity), while Green and Yellow VO colours concern dynamics, relativism and interconnected elements (more complexity).

Furthermore however, there is little meaningful difference between the patterns of frequencies of Levels of Work and rejected values orientations.

However, if we express the frequencies in Tables 39 and 40 as proportions of the total number of observations within each sample, there are some magnitude differences. But whether these are meaningful in terms of the global trends is perhaps, a moot point.

Table 41: Comparison of Sample 1 and 2 CPP Level of Work x Rejected Orientation frequencies &amp; proportions

	Sample 1		Sample 2	
Orientation	No. of aggregated records Current Level of Work	Percentage of aggregated records	No. of aggregated records Current Level of Work	Percentage of aggregated records
	95	18.85	90	25.71
	44	8.73	25	7.14
	1	0.20	21	6.00
	10	1.98	10	2.86
	6	1.19	23	6.57
	71	14.09	49	14.00
	277	54.96	132	37.71

With respect to the CPP Potential Level of Work variable, we see the same kind of consistent monotonic trend observable in Figures 41 and 42.

## 4.2 CPP Cognitive Styles

### 4.2.1 Accepted Orientations

Four examples are presented below, using the data from both samples, showing the over-arching similarity of style scores, and ranked cognitive styles across both the accepted and rejected values orientations. The reason for this homogeneity of scores and ranks across values is because the respondents within the samples are themselves homogenous with respect to job role, training and qualification, and managerial/leadership level within that role.

As can be seen below, the median style score for each orientation are clustered within 10 score-points within a 0-100 measurement range.

Figure 45: CPP Analytical Style T-scores x Value Orientations - Sample 1

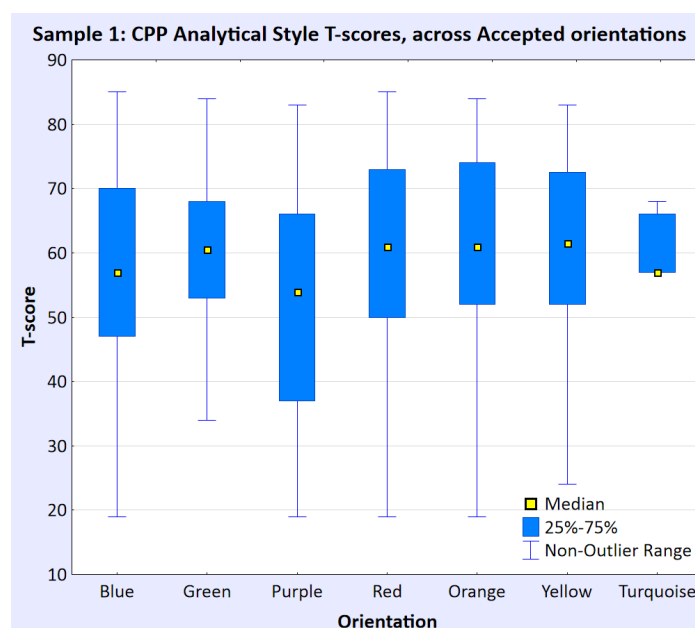


Figure 46: CPP Holistic Style T-scores x Value Orientations - Sample 1

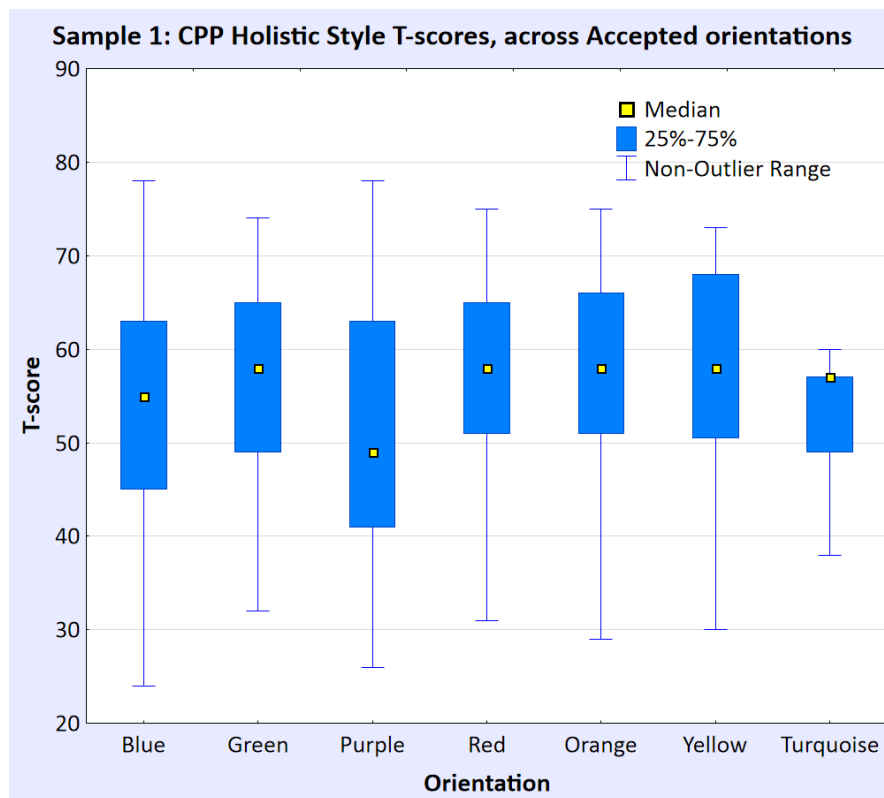


Figure 47: CPP Structured Style T-scores x Value Orientations - Sample 1

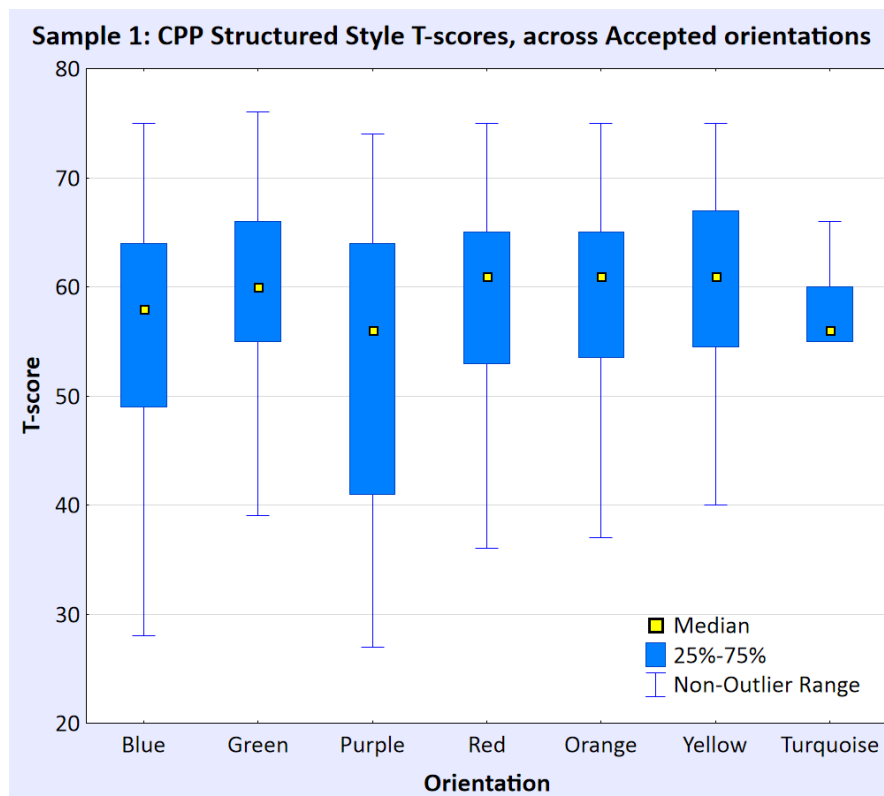
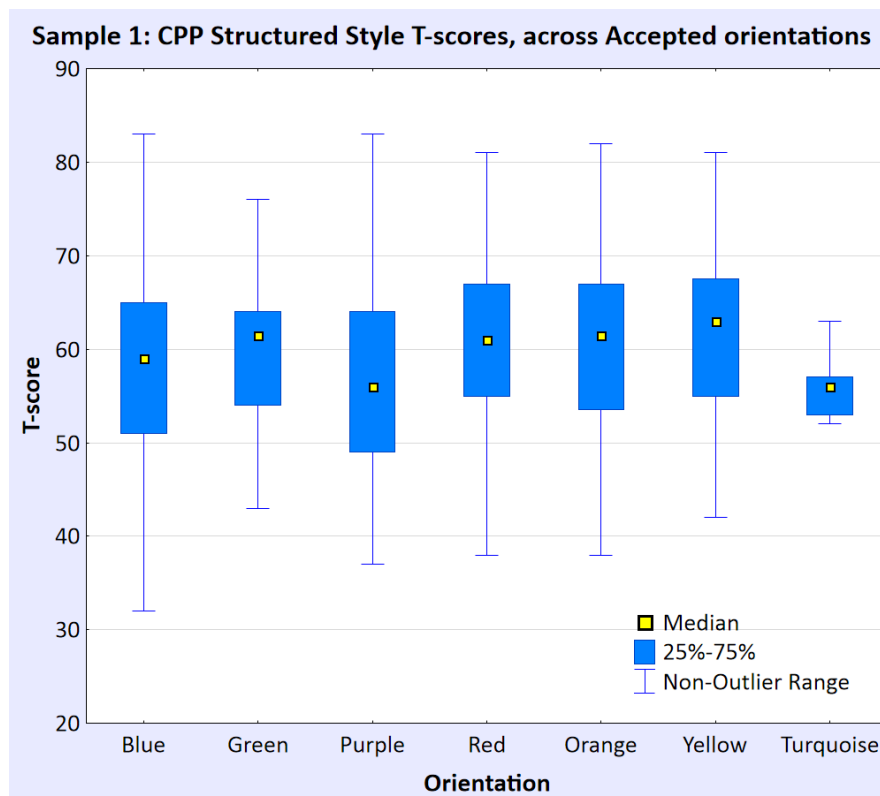
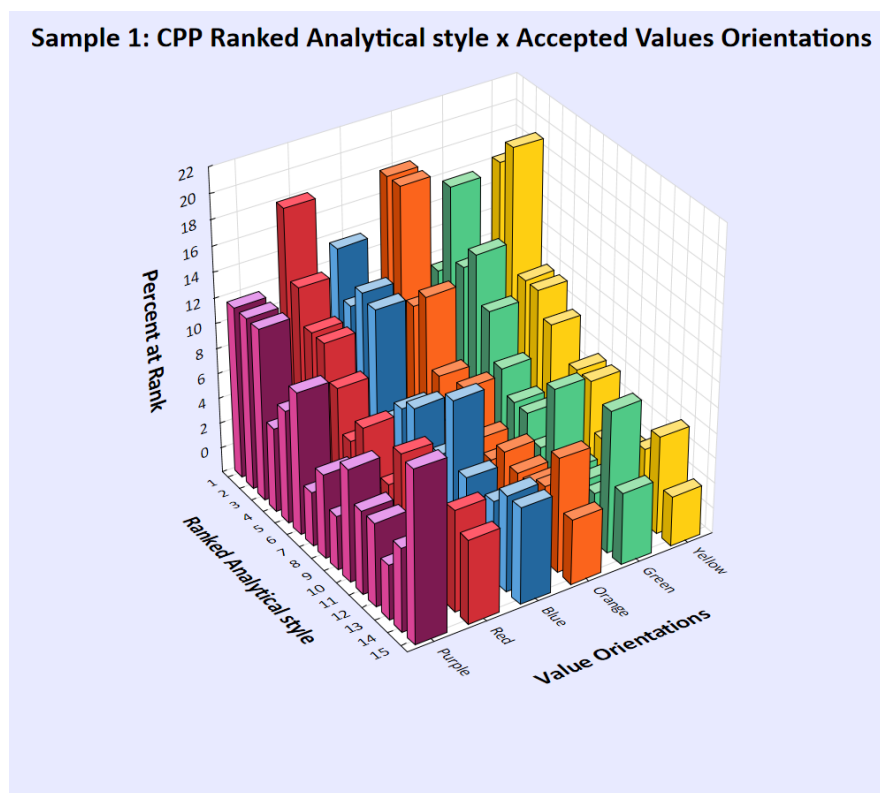


Figure 48: CPP Learning Style T-scores x Value Orientations - Sample 1



If we instead rank the 15 styles scores for an individual, and look at how these ranks are distributed across the orientations, the same homogeneity is present. For example:

Figure 49: CPP Ranked Analytical style x Accepted orientations – Sample 1



The percentage frequencies of occurrence of each rank for each accepted orientation plotted in Figure 49 are:

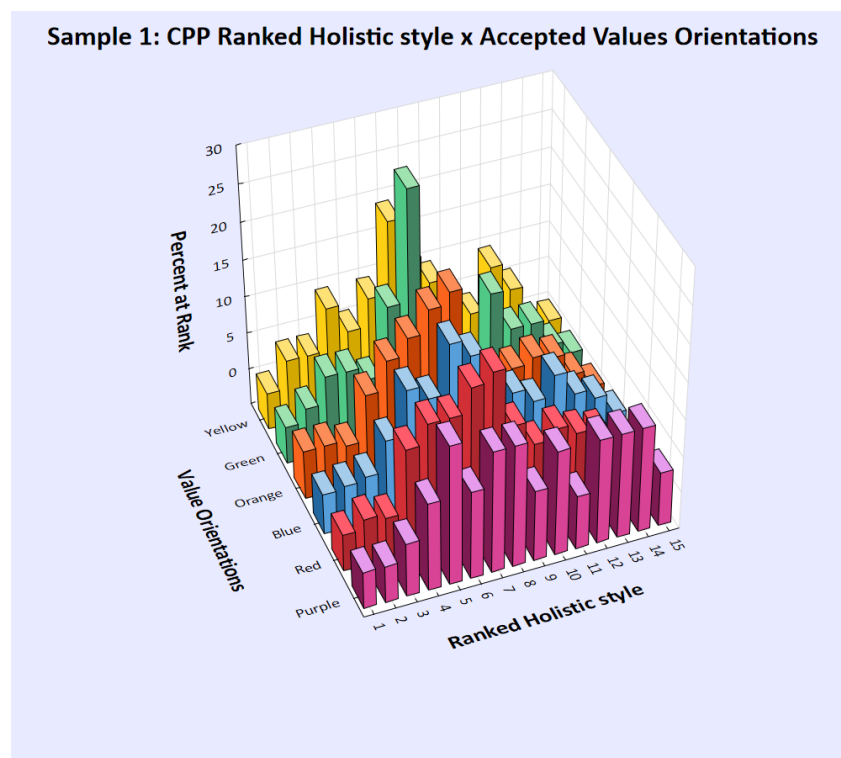
Table 42: CPP Analytical Ranked Style - percentage frequencies of occurrence of each rank for each accepted orientation – Sample 1

	Percent at Rank ... CPP Ranked Analytical style x Accepted Orientations						
	1 Purple n=43	2 Red n=150	3 Blue n=213	4 Orange n=128	5 Green n=54	6 Yellow n=52	7 Turquoise n=5
1	11.63	18.00	13.62	17.97	9.26	7.69	20.00
2	11.63	12.67	9.86	17.97	16.67	17.31	20.00
3	11.63	10.00	11.74	9.38	11.11	19.23	20.00
4	4.65	10.00	11.27	10.94	12.96	9.62	0.00
5	6.98	7.33	3.29	5.47	9.26	9.62	20.00
6	9.30	4.00	5.16	2.34	5.56	7.69	0.00
7	2.33	6.00	6.10	6.25	3.70	1.92	20.00
8	4.65	2.00	2.82	3.13	3.70	5.77	0.00
9	2.33	3.33	4.23	2.34	1.85	5.77	0.00
10	6.98	6.67	9.39	3.91	7.41	1.92	0.00
11	4.65	5.33	4.23	3.13	1.85	1.92	0.00
12	4.65	0.67	2.82	3.13	1.85	0.00	0.00
13	2.33	3.33	4.23	3.91	1.85	3.85	0.00
14	4.65	6.00	5.63	7.03	9.26	5.77	0.00
15	11.63	4.67	5.63	3.13	3.70	1.92	0.00

It appears that the Red and Orange values have the highest percentage of acceptance when the Analytical style was measured as the primary problem-solving style. However having the Analytical style ranked as the secondary or third style still suggests a very strong analytical tendency, therefore the high percentage of Green and Yellow values are also worth noting. The Red, Orange and Yellow values all represent a very individualistic approach, and although they have different internal drives, the tendency to make individual choices over group choices is prominent, as can be seen here in their tendency to examine information in a very detailed, fact-based way, suggesting rigour and a reluctance to merely accept information on the surface. The Green values also seem to be associated with this style, possibly because of the theoretical inclination of those with Green values, and their desire to break information down in order to understand other points of view.

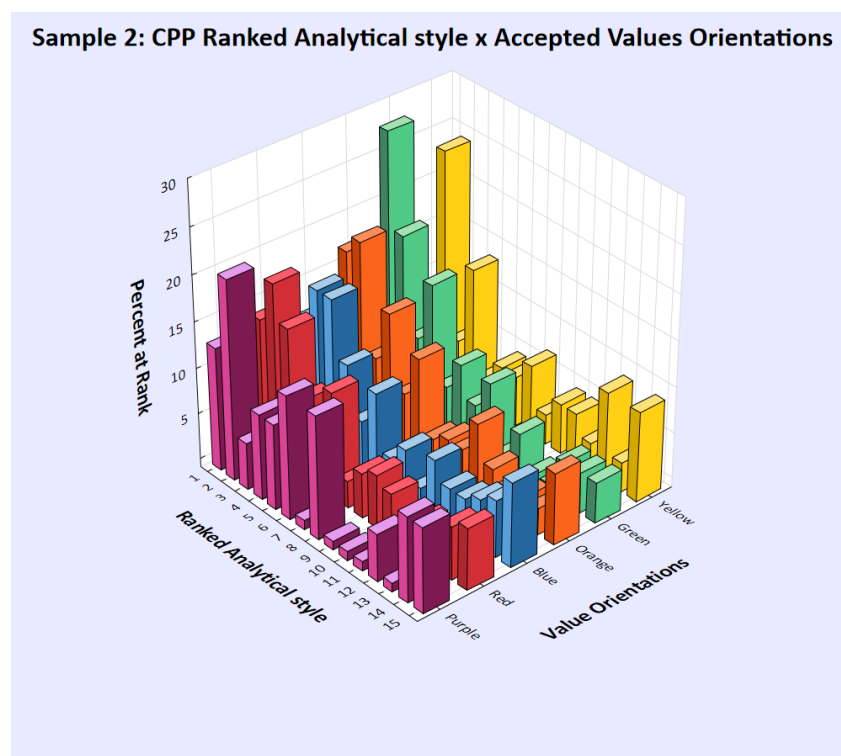


Table 43: CPP Ranked Holistic style x Accepted orientations – Sample 1



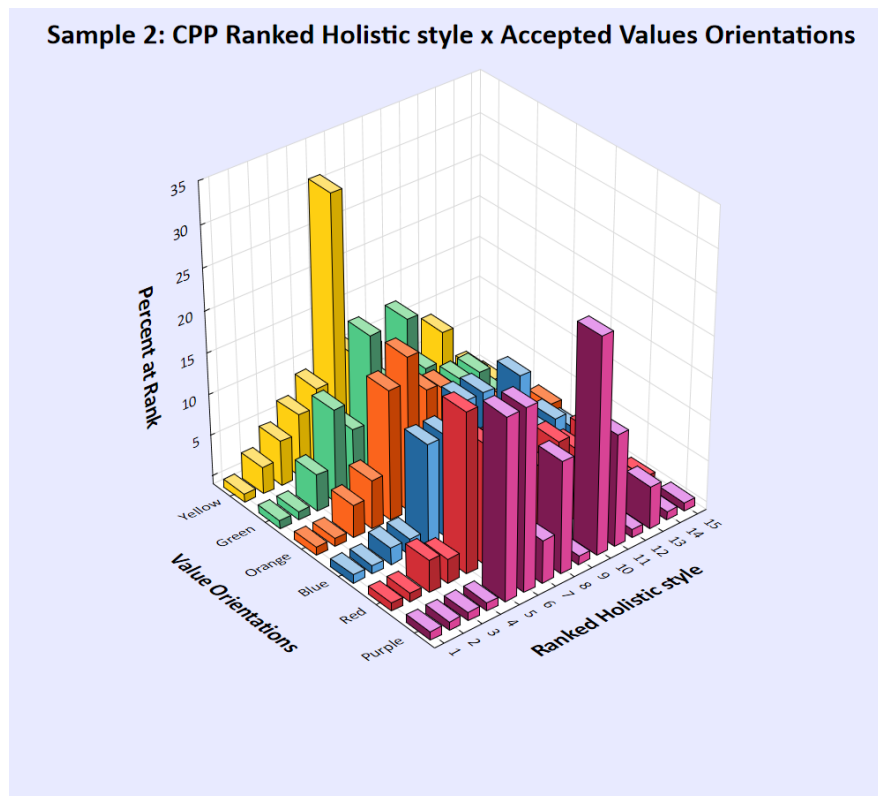
There is no clear differentiation among the accepted value systems when the Holistic style was selected as one of the dominating styles. There is only slight elevation of the Yellow values. Both the Holistic style and the Yellow values are characterised by a big-picture view and the tendency to view the whole part rather than the details. For Sample 2 data, the results are very similar to those using Sample 1 data.

Figure 50: CPP Ranked Analytical style x Accepted orientations – Sample 2



The Green and Yellow value orientations are also associated with the Analytical style in this sample. Both value orientations are associated with a deeper understanding of situations as opposed to blindly accepting new information as being true.

Figure 51: CPP Ranked Holistic style x Accepted orientations – Sample 2



As with sample 1, there is no clear differentiation among the accepted value systems when the Holistic style was selected as one of the dominating styles. The Yellow values appear to be strongly distinguished from the rest only when the Holistic style is ranked as the sixth style, so this is not particularly noteworthy. Both the Holistic style and the Yellow values are characterised by a big-picture view and the tendency to view the whole part rather than the details.

### 4.2.2 Rejected Orientations

With respect to the rejected orientations, Sample 1 data showed that just four orientations were assigned as rejected in 97% of Sample 1 data (see Table 39). Rather than reporting the data as graphics, it is perhaps interesting to show the proportions associated with the rank position of the CPP style across the four orientations, although the same homogeneity of rank-order is easily discerned.

Table 44: CPP Analytical Style x Rejected Orientations, Sample 1

Percent at Rank - Analytical style x Rejected Orientations: Sample 1				
	1 Purple n=95	2 Red n=44	3 Yellow n=71	4 Turquoise n=277
1	9.47	11.36	9.86	16.61
2	24.21	9.09	12.68	13.36
3	10.53	20.45	4.23	10.47
4	13.68	9.09	11.27	10.47
5	5.26	11.36	4.23	5.42
6	4.21	6.82	4.23	5.05
7	3.16	2.27	4.23	6.14
8	3.16	4.55	5.63	2.53
9	2.11	4.55	5.63	2.53
10	6.32	6.82	11.27	6.86
11	0.00	2.27	9.86	3.97
12	2.11	0.00	2.82	2.53
13	3.16	6.82	5.63	3.25
14	6.32	4.55	2.82	5.78
15	6.32	0.00	5.63	5.05

The rejection of Turquoise values is consistently the highest among the samples, owing to its abstract and transcendent approach. The Purple values also appear to show some differentiation when the Analytical style is ranked as the secondary style. Purple values are represented by strong traditionalist views, where magical thinking is also a major aspect of the worldview. An analytical, fact-based approach is therefore in stark contrast to magical thinking, resulting in stronger rejection of the Purple values system.

Table 45: CPP Holistic Style x Rejected Orientations, Sample 1

Percent at Rank - Holistic style x Rejected Orientations: Sample 1				
	1 Purple n=95	2 Red n=44	3 Yellow n=71	4 Turquoise n=277
1	2.11	0.00	0.00	0.72
2	1.05	2.27	1.41	1.08
3	4.21	0.00	0.00	1.81
4	4.21	4.55	7.04	7.94
5	13.68	4.55	9.86	11.55
6	12.63	13.64	11.27	11.19
7	17.89	25.00	16.90	15.52
8	12.63	15.91	12.68	15.88
9	8.42	9.09	12.68	7.58
10	3.16	2.27	4.23	6.50
11	6.32	11.36	4.23	6.14
12	7.37	9.09	7.04	6.14
13	5.26	0.00	5.63	5.05
14	1.05	2.27	7.04	2.17
15	0.00	0.00	0.00	0.72

No clear differentiation among the rejected values is displayed for the Holistic style preference.

Table 46: CPP Structured Style x Rejected Orientations, Sample 1

Percent at Rank - Structured style x Rejected Orientations: Sample				
	1 Purple n=95	2 Red n=44	3 Yellow n=71	4 Turquoise n=277
1	1.05	0.00	0.00	0.72
2	1.05	9.09	4.23	4.69
3	6.32	13.64	9.86	5.42
4	13.68	9.09	4.23	13.36
5	17.89	13.64	11.27	16.25
6	16.84	18.18	14.08	14.80
7	10.53	18.18	9.86	12.27
8	5.26	9.09	15.49	9.75
9	11.58	2.27	12.68	9.39
10	6.32	6.82	8.45	5.05
11	5.26	0.00	2.82	3.61
12	4.21	0.00	5.63	2.89
13	0.00	0.00	0.00	1.81
14	0.00	0.00	1.41	0.00
15	0.00	0.00	0.00	0.00

There is only a slight elevation of Red value rejection when the Structured style was ranked second. The Structured style suggests strong rule-following, and can somewhat be linked to a preference for avoiding conflictual behaviour. The shadow or unhealthy manifestations of the Red values suggest forceful, dominant and conflict-prone behaviour.

This same overall homogeneity of responses was the same across all CPP style ranks and scores for both Sample 1 and Sample 2. However, Sample 2 did show greater frequencies of Blue and Green rejected orientations, although the selection of Orange as a rejected orientation was still very low (just 3% of observations), and excluded from the tables below.

Table 47: CPP Analytical Style x Rejected Orientations, Sample 2

Percent at Rank - Analytical style x Rejected Orientations: Sample						
	1 Purple n=90	2 Red n=25	3 Blue n=21	4 Green n=23	5 Yellow n=49	6 Turquoise n=132
1	18.89	8.00	4.76	13.04	6.12	15.91
2	18.89	24.00	19.05	21.74	16.33	20.45
3	4.44	8.00	14.29	4.35	14.29	12.88
4	12.22	8.00	9.52	8.70	10.20	9.09
5	4.44	4.00	0.00	4.35	6.12	5.30
6	7.78	4.00	14.29	0.00	8.16	9.09
7	3.33	4.00	0.00	4.35	2.04	1.52
8	4.44	8.00	4.76	13.04	2.04	3.79
9	2.22	0.00	0.00	8.70	6.12	3.03
10	4.44	0.00	4.76	4.35	2.04	5.30
11	3.33	4.00	4.76	0.00	0.00	2.27
12	1.11	0.00	4.76	4.35	2.04	2.27
13	3.33	12.00	14.29	0.00	6.12	2.27
14	3.33	4.00	0.00	0.00	8.16	3.03
15	7.78	12.00	4.76	13.04	10.20	3.79

When the Analytical style was ranked first, the rejection of Turquoise, Purple and Green appears noteworthy, however the number of those rejecting Green is very low compared to Purple and Turquoise. As mentioned

above, the transcendent Turquoise values and the magical-thinking Purple values do not correspond well with factual analytical thinking, however the theoretical approach associated with the Green values seemed to correlate with the Analytical style (Figure 50). Negatives aspects associated with Green values include indecisiveness, which may account for the rejection by a few of those with the Analytical style however this number may be too small to be significant.

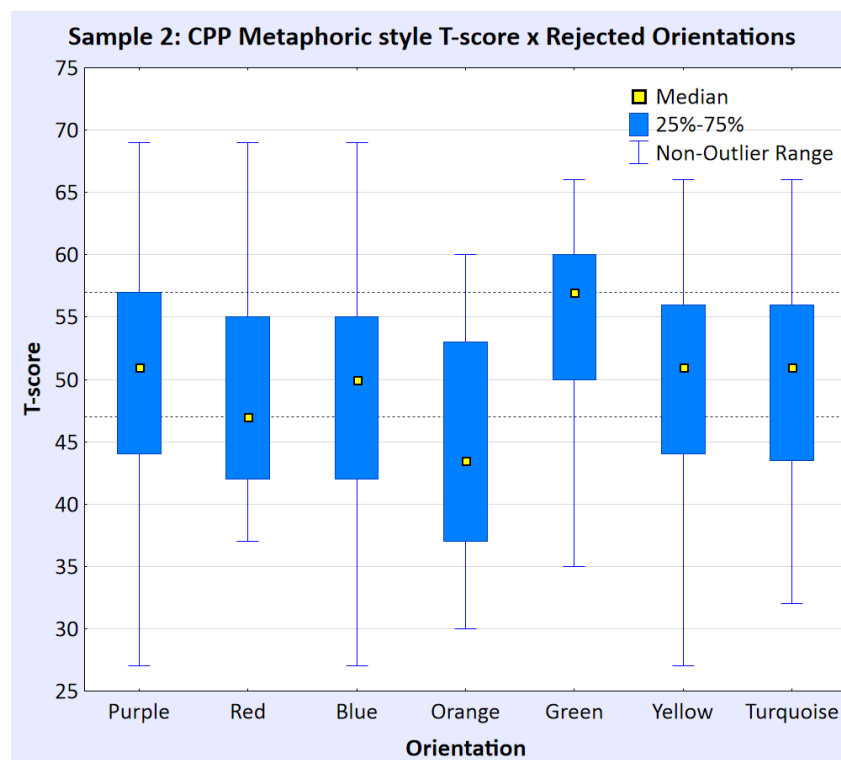
Table 48: CPP Structured Style x Rejected Orientations, Sample 2

	Percent at Rank - Structured style x Rejected Orientations: Sample					
	1 Purple n=90	2 Red n=25	3 Blue n=21	4 Green n=23	5 Yellow n=49	6 Turquoise n=132
1	0.00	4.00	0.00	0.00	0.00	1.52
2	4.44	4.00	14.29	0.00	0.00	4.55
3	7.78	4.00	9.52	4.35	8.16	9.09
4	5.56	8.00	9.52	8.70	14.29	15.15
5	24.44	20.00	14.29	13.04	16.33	20.45
6	17.78	28.00	4.76	17.39	10.20	15.91
7	12.22	4.00	9.52	4.35	12.24	11.36
8	7.78	4.00	14.29	13.04	6.12	9.85
9	7.78	8.00	9.52	13.04	6.12	3.79
10	4.44	4.00	9.52	13.04	16.33	3.79
11	4.44	0.00	4.76	8.70	4.08	3.03
12	3.33	12.00	0.00	0.00	2.04	0.76
13	0.00	0.00	0.00	4.35	4.08	0.76
14	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00

The slight elevation in rejection of Red values is observed within the primary Structured style preference. There also seems to be elevated rejection of Blue values when the Structured style was selected as the secondary style. The majority of this sample has rejected Turquoise, and the small numbers rejecting Red and Blue values may not be significant. The negative aspects of these two value systems that could possibly be rejected are the conflict-prone behaviours (Red) and rigidity (Blue). Although both Blue values and the Structured style are associated with order and containing chaos, those using a Structured style could still be very open to new information and enjoy incorporating new information into existing paradigms. The rejection of Blue values could be based on the rejection of following the status quo and maintaining structure out of a sense of duty. For those with the Structured style, the rule-following could be more a theoretical/academic guideline rather than adherence to a code of conduct.

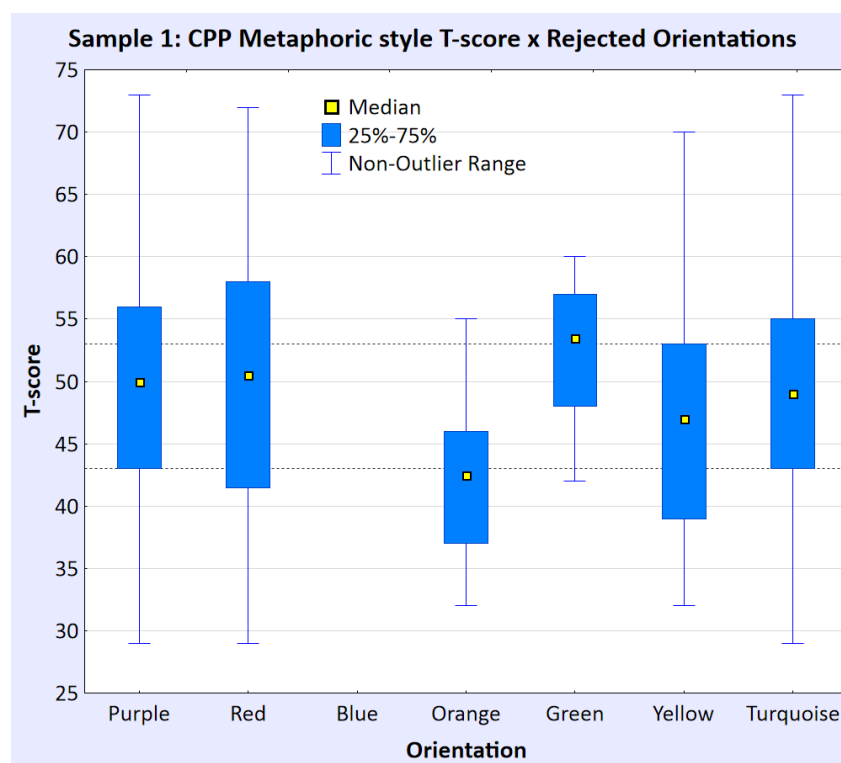
And, as Figures 52 and 53 show, the same homogeneity is observed in the T-scores for both samples, with median T-scores mostly with a 10-point T-score range.

Figure 52: Box Plot of Metaphoric Style T-scores x Rejected Orientations - Sample 2



The two dashed 'reference' lines are at T-score 47 and 57, again showing all but the Orange rejected orientation medians are within a 10-point score range across all orientations. For Sample 1 data, same CPP attribute, excluding the Blue orientation which only possessed 1 observation, the T-score data look like:

Figure 53: Box Plot of Metaphoric Style T-scores x Rejected Orientations - Sample 1



\*Note: The two dashed 'reference' lines are at T-score 43 and 53.

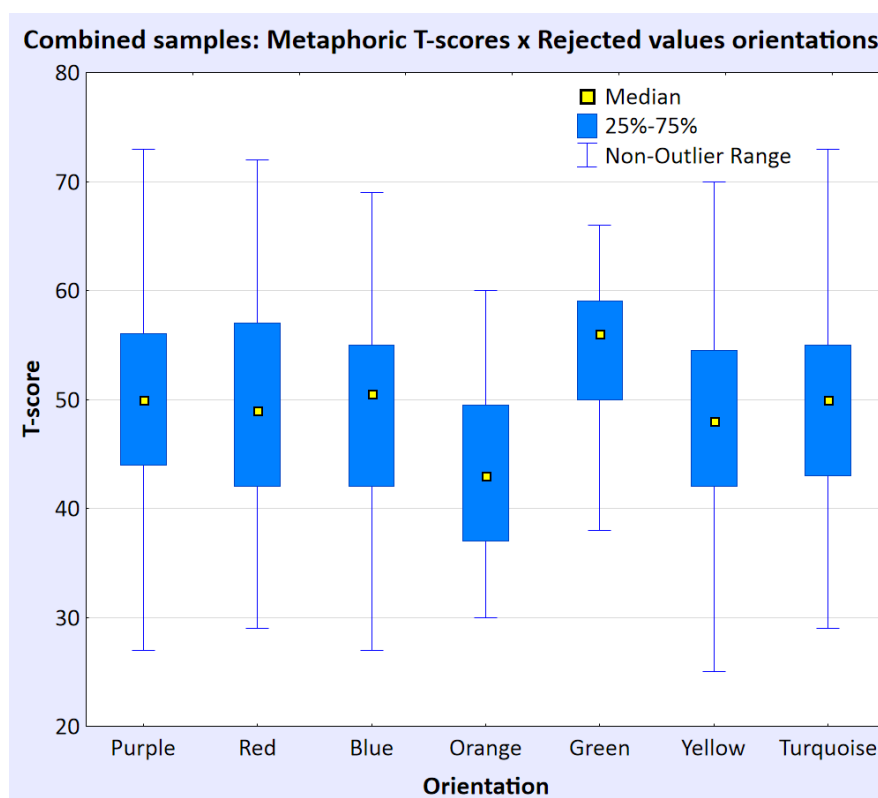
Of interest, if we combine both samples of data (in order to increase the counts for Blue, Orange, and Green rejected orientations), we have the following counts:

Table 49: Combined sample data, Metaphoric style T-scores x Rejected orientation frequencies

Orientation	No. of aggregated records combined from both samples of data: Rejected Orientations
Purple	185
Red	69
Blue	22
Orange	20
Green	29
Yellow	120
Turquoise	419

With a box-plot of the scores across orientations showing the same degree of homogeneity:

Figure 54: Combined sample data, Metaphoric style T-scores x Rejected orientation Box Plot



In all three diagrams (Figure 52; 53 and 54), it appears that the rejection of the Green values are elevated while a non-rejection of Orange values seem notable. The opportunity-seeking behaviour of those with Orange values may correspond with the Metaphoric tendency to look for extra meaning in situations, or opportunities to provide creative flair if it means obtaining higher levels of productivity. There was some correlation between the creative Plant role (Belbin) and the Orange values (Figure 25). The number of those rejecting Green is much smaller than those rejecting Turquoise, Purple, Yellow and Red, thus suggesting limited significance, especially because Green values are also linked to a tolerance of various ideas, hypotheses and worldviews.