

## The Diversity Icebreaker as a psychological assessment – a cognitive diversity model?

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### Introduction

Today, the Diversity Icebreaker is a concept combining a **psychological questionnaire** measuring dimensions labelled Red, Blue and Green with a **workshop process**, oriented towards experiential learning. The questionnaire yields results which serve as a stimulus for group activities which, in a “here-and-now”, bottom-up process, build shared definitions of the dimensions.

Red, Blue and Green originated in a project which started in 1994. Since then, several different practices and major changes have been introduced. First, the concept's application has been continuously growing in volume and the questionnaire was introduced as a commercial product in 2004. In 2011 alone, the questionnaire was used more than 23 thousand times, with translations in nineteen languages<sup>1</sup> available for commercial use. Second, from a research point of view, 2004 was a major turning point – the questionnaire with its partial-ipsative format was launched. The partial ipsative format gives the respondent freedom to distribute six points among three items from each of the dimensions, keeping the dimensions dependent on each other in the traditional ipsative format, but at the same time, giving each item a score of 0 – 6, thus making it possible to run variance analysis. To date, six more<sup>2</sup> language versions are available for

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1. Norwegian, Danish, Swedish, Finnish, English, American, Russian, Japanese, Chinese, Hebrew, Arabic, French, German, Italian, Spanish, Portuguese,

Dutch, Bulgarian, Serbian, Polish.

2. In addition to the nineteen languages above: Slovenian, Czech, Romanian, Turkish, Slovakian, Thai, Lithuanian

research purposes. More than twenty different research projects have been initiated, involving over forty-five researchers from twenty countries. The concept has been presented at more than twenty academic conferences<sup>3</sup> and two papers have been published in peer reviewed journal (Mæhle & Shneor, 2009; Romani, 2013). One edited book has been published containing mainly academic conference presentations with eleven authors involved (Ekelund & Langvik, 2008).

Human Factors AS is a consultation company founded by Bjørn Z. Ekelund – the company has been promoting research, development, and commercial use of the concept since 1994. When “we” is used in this article, it refers to Human Factors AS and its employees.

This is the first article that describes, in depth, the development of the concept and the character of the three dimensions integrated in the questionnaire. It aims to give an updated and revised answer to the question often asked by psychologists: “What does a questionnaire really measure?” We will argue in the latter part of this article that the answer is: cognitive diversity.

## Overview

This article presents the theoretical and empirical history of Red, Blue and Green, the three dimensions of the Diversity Icebreaker, in the period from 1995 to 2012. The historical presentation contextualises the different theoretical perspectives that have emerged in parallel to the concept’s use in different contexts. Red, Blue and Green have been presented as preferences for types of information (Ekelund, 1997), preferences for communication and interaction (Sydorenko, 2012), alternative team roles (Ekelund &

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3. Among others: Academy of Management, Academy of International Business, Society for Industrial and Organisational Psychology, Society for Intercultural Training, Education and Research, South-East European Regional Conference on Psychology, Conference on Social and Community Psychology, Serbian Psychological Conference, International Conference on Intercultural Communication.

Jørstad, 2002), and, sometimes, even as an alternative personality team traits model (Langvik, 2006). However, as it will be shown in the present paper, the knowledge and fields of study pertaining to the cognitive psychology resonate well with the concepts of Red, Blue and Green, and make it possible to trace the history of their development in a novel way. The revisiting and rewriting of the history, combined with new research data, are the reasons for defining the Red, Blue and Green model as a cognitive diversity model. The repositioning of the concept in relation to cognition enables us to specify areas for future academic research. Furthermore, the Diversity Icebreaker concept is most often used with teams, and research indicates that it is cognitive models that are better applicable in the field of diversified teams than personality traits (Basadur & Head, 2001; Shin et al, 2012).

## **History of Red, Blue and Green:**

### ***1994: The creation of Red, Blue and Green***

In December 1994, Human Factors AS started a five-year consultation project with a client – Akershus Energi. The task we were given was to help to “make people reduce energy consumption”. The categories of Red, Blue and Green as communication strategies emerged early on in this project and became the platform for specific market communication and consultation towards different consumer segments. A full description of the challenges facing the client, the design process, implementation and evaluation of this engagement have been presented in Ekelund’s MBA dissertation in 1997 at Henley, London (Ekelund, 1997). Here, we will focus more on the process, in which the categories of Red, Blue and Green emerged, with a discussion of the consequences of the method used in relation to psychological research, as well as to their practical use.

Akershus Energi was involved in marketing and consulting concerning the reduction of energy consumption in private households. Together with a group of marketing and public

relation companies, Human Factors AS was asked to redesign their communication strategies, so that they could reach out for new target groups. In order to define these new groups and suggest ideas for communicating better with these market segments, customers were invited to take part in focus groups working on a following general communication challenge: “How to communicate with other in order to make them reduce their energy consumption?” Twenty-seven customers in four groups took part in the group work. The work was organised according to the principles of brain-writing presented in the work of VanGundy (1981), combined with ideas from the qualitative method for conceptualizing unstructured material as described in Strauss & Corbin (1990). The customers produced 161 ideas in total and were then asked to group the ideas based on “which of them belonged to each other – and which were different”. Three main categories of ideas emerged in all the four focus groups and they encompassed 121 ideas out of the overall 161 produced. The 40 other ideas that did not make it into any of the three main categories – they varied in structure and content to an extent that made it difficult to categorise them in a meaningful way (and for this reason it was impractical to prioritise them as targeted goals in the market communicative initiative). Of the three main categories, one was defined as being economically motivated, one as environmentally motivated, and the last one as motivated by social factors. The groups were assigned the three-colour nicknames because of the similarities with the political colours in the Norwegian political party structure: Blue (the conservative side, more concerned with the economic conditions), Red (the social democratic / socialist side, concerned with social welfare) and Green (the environmentalists, willing to take a global perspective).

The marketing campaign was designed to follow the sequence described below:

- a. Attract attention through different market campaigns in newspapers, where Red, Blue or Green communication strategies varied in content and colour background. It was not intended that the colours themselves should convey any meaning. They only identified the strategies for internal and

external communication. The market communication ended by inviting people to make contact with Akershus Energi in order to get advice and tools for reduction of energy consumption.

- b. Advisors from the client organisation were trained to reinforce the customers' seeking-contact-for-more-information behaviour in order to build their own self-confidence as information seekers and competent problem solvers in this area.
- c. Advisors were trained to give advice for technological and behavioural change along with the Red, Blue or Green strategies due to what seemed to trigger a customer's interest and build his or her confidence in the future, behavioural change.
- d. Written material was given to clients where they could read guidelines and information themselves and self-select arguments from a Red, Blue or Green perspective.

Ekelund's dissertation (1997) documented that the campaign reached 16 thousand customers out of 145 thousands of the targeted population (of a Norwegian county). The cost-benefit was evaluated and pay-back of the campaign costs was measured at twenty-three million NOK (in relation to the estimated costs of the campaign – five million NOK). The evaluation was performed applying three different methods: i) comparisons between counties on energy consumption, ii) estimation of how many new, ecologically friendly, devices were installed, and iii) interviews with 96 customers in order to estimate the effect of behavioural change and technological implementation.

In retrospect, the whole process of attracting interest by differentiated Red, Blue or Green adverts, establishing a relationship, reinforcing the relationship and then introducing differentiated Red, Blue or Green information within the established communicative relationship; seems to have been a complex, behavioural-cognitive-attitudinal process, aligned with communicative strategies in order to influence the behaviour of others.

Even though the processes described in a), b), c), and d) above are complex, the particular elements follow each other in a sequence. If the end results are positive, as has been documented, it is probably right to state that some of the steps must have had some successful outcomes. Beyond any doubt, the initial activities attracting customers must have been effective. If any of the later steps had not functioned, the end result could not have turned out positive either. We can therefore conclude that each of the following elements has been at least partially effective. Thus, adverts attracted people and the consumers decided to contact the company and seek advice. The training of the consultants, whereby they were primed to reinforce either Red, Blue or Green customer communication strategy, continued or reinforced the process. It is difficult to estimate the level, at which the written material had a reinforcing effect on customer problem solving and decision making, in the final phase, since an experimental design was never conducted. Attention, perceiving, language, problem solving and decision making are all valid activities in order to understand the different elements in this consumer behaviour process. They are all the cognitive processes and will be discussed in relation to the Red, Blue and Green model later.

A central aspect that has not been highlighted in the original work from 1997 (Ekelund, 1997) is that the categories of Red, Blue and Green emerged from a process where randomly invited customers (a random sample of individuals who were not experts in marketing, social communication, or energy consumption), were involved. The three categories emerged in what Moscovici termed the process of **common sense categorisation**, in opposition to reified scientific methods (1984), like, for example, factor analysis where each factor is intended to capture the entire variance of a given variable or facet. On the one hand, this may lead to the categories being easier to understand and various behaviours easily ascribed to one of the colours by the seminar's participants. On the other hand, it might be problematic to confirm the three colours as orthogonal, separate factors in the analysis of variance. Since only 121 out of 161 ideas were grouped belonging to the Red, Blue or Green categories, the remaining 40 were probably examples of behaviours that did not fit into the struc-

ture. The total picture of variance is not captured. A consequence of this common sense categorisation is a conceptual structure that might be difficult to comply with the classical statistical analysis strategies usually applied to results of personality questionnaires. A German student (Sydorenko, 2012) demonstrates this in a study where she shows how different statistical methods in three different language samples (German, Norwegian and English) come out with partially different results. Even though her samples are small (German N= 117, Norwegian N= 127 and English N= 59) it illustrates that some items in the questionnaire do not pertain clearly to either of the categories (Sydorenko, 2012).

Nonetheless, we believe that the easiness of application of the model when working with ordinary people is its prevailing advantage. The categories are behaviour oriented and non-orthogonal and for this reasons we believe that they are more flexible when applied to role behaviour than a categorical, personality structure, especially if a personality model is a typology, like MBTI (Gardner & Martinko, 1996, Rothausen & Ekelund, 2008). These assumptions should be tested empirically.

### ***1997: The construction of the questionnaire***

Following the success of the campaign, we (Human Factors AS) were asked, in 1997, to design a questionnaire that would make it possible to identify levels of Red, Blue or Green among the different customers interacting with the company at different times and places. Two psychological traditions that shared similar ideas of “how to communicate in order to change the behaviour of the other” were recognised in the theoretical work of creating adverts and communication strategies. One was the tradition of learning and teaching styles (Honey & Mumford, 1992, Gardner, 1993), and the other one was based on team role concepts where Belbin’s and Margerison & McCann’s work was perhaps best known and often used in Europe (Belbin, 1981; Margerison & McCann, 1991) while MBTI was widely applied in the USA (Matthews & Deary (1998). Margerison & McCann’s model gives practical advice on communication styles based on different

typologies (McCann, 1988). These perspectives influenced both the campaign strategies and the creation of the first version of the questionnaire used as a market segment identifier. In a report prepared for Akershus Energi a consultant in Human Factors AS, Trond Ivar Hegge, describes the process of developing the questionnaire (Hegge, 1997). One hundred questions were picked from already established concepts of personality, interactional preferences and team roles. The questions were all formed into a Likert scale format. One hundred persons answered the questionnaire. Fifteen items on each colour were identified through a cluster analysis performed in a simple form where items were picked and taken out by hand. The criteria for what was selected in or out were internal reliability and face validity of the items. The internal reliability measured with Cronbach's alpha of the dimensions of Red, Blue and Green in this first study with  $N=100$  and using Likert scales were medium; Green  $\alpha=.62$ , Red  $\alpha=.66$  and Blue to  $\alpha=.70$  (Hegge, 1997).

In the first questionnaire for market segmentation it was decided not to use the Likert scale but rather ask respondents to prioritise one out of three items, thus following a classical, ipsative format. The three items were taken from the group of items belonging to Red, Blue or Green according to the analysis described above. Which three items to present in opposition to each other was decided by selecting items that had the same type of content or verbal structure (for example, Red: I show my feelings; Blue: I am practical-minded; Green: I often try new things). The scoring results varied between 0 and 15 on each of the three dimensions. The sum for each respondent was 15 due to the ipsative format. In the following years, different studies of market segment analysis were conducted using the questionnaire with this ipsative format, including some related to gender and specific market adverts. One of the findings was that females were scoring higher on the Red dimension (Hegge, 1998).



### **1998: Launched as an alternative team-role concept**

The questionnaire was included in the training manuals (Ekelund & Jørstad, 2002) for the concept of Team Climate Inventory (Ekelund & Jørstad, 1998) as a simpler team-role concept and an alternative to TMS (Margerison & McCann, 1991) and Belbin (1981). This strengthened the use of the concept in team and organisational development where preferences for interaction and distribution of tasks were the main focus. The chapter on managing diversity in cross-professional teams is aligned with this perspective (Ekelund, 2009c, *ibid.*).

### **2004: A separate questionnaire with training material**

Following these publications and the consultants' use of the questionnaire, we were receiving positive customer feedback and requests for more advice concerning the use of both the questionnaire and its application in seminars. In response, we published a brochure in 2004 integrating the questionnaire with training guidelines. The questionnaire was named *Human Factors' Personal Preference Questionnaire for Teamwork and Team roles* due to its focus on teamwork and in line with parts of its developmental history described above. Some customers, for example, the Norwegian Labour Party (Sivertsen, Ekelund & Esnault, 2004), were offered tailor made materials where the name of the tool was related to diversity and communication.

The brochure also featured a structured description of a process whereby the participants are asked, in groups of the same colour, to put the ideas they have about what their own colour is like, as well as ideas about the other two colours, on a flip-chart in order to share them later with other groups. In this way the gap between the actor and observer perspectives, and personal vs. social identity (Tajfel & Turner, 1979), could be pedagogically utilised (Jones & Nisbett, 1972). These steps were later to become the first three stages of what has been called *the classic Diversity Icebreaker seminar*, described in different papers

and books (Ekelund & Langvik, 2006, Ekelund & Langvik, 2008, Ekelund, Davcheva & Iversen, 2009, Ekelund, 2010).

### **2004: First revision of the questionnaire into a partial ipsative format**

The ipsative scoring format described above does not allow for the possibility of ranking between the two items that were not preferred. In 2004 we came across an innovative version of the ipsative format in the *Shapes* questionnaire ([www.cut-e.com](http://www.cut-e.com)). In this partial ipsative format the respondents were asked to spread the total of six points between three different items opposing each other. This gave each item a potential of getting between 0 to 6 scores, which increased the possibility to run more advanced statistical analysis, e.g. different variance analysis. This particular scoring format was labelled *partially ipsative*.

This format is ipsative in the sense that the scores in the Red, Blue and Green dimensions are dependent on each other. If a person scores very high in Blue, the scores on the other two dimensions will be consequently lower. This forced choice format is especially good for intrapersonal comparison, i.e., the individual's score in one dimension is compared against his or her score in the other dimensions (Langvik, 2006). The psychometric characteristics of ipsative scales differ substantially from those of normative, i.e. traditional, scales since the ipsative scales force dependency among responses given by the individual (Nysæter et al, 2009). Ipsative scores in factor analysis are claimed to produce artificial bipolar factors and for that reason factor analyses of ipsative data are often dissuaded (Dunlap & Cornwell, 1994). This new format, however, opened up opportunities for variance analysis used for documenting and improving reliability, as well as made it possible for us to do empirical validation studies in the years to come. More empirical comparisons of the use of the partially ipsative format compared to the Likert scale format are needed to explore and ensure the quality of use of different statistical procedures.

## **2005: Second revision of the questionnaire**

The version used from May 2004 until June 2005 consisted of 15 items for each dimension of Red, Blue and Green. A study of internal consistency with 376 respondents showed that one of the questions was negatively correlated with the dimensions (Ekelund & Langvik, 2008). From July 2005 the questionnaire was reduced to 14 items per dimension and this is the version in use today. The internal consistencies measured with Cronbach's alpha are for Red  $\alpha=.81$ , Blue  $\alpha=.82$ , and Green  $\alpha=.75$  (Ekelund & Langvik, 2008).

## **2005: First data analysis with empirical validation**

Since 1995 the concept has been described in relation to different theoretical constructs, but the first empirical validation studies began in 2004 following the introduction of the six-point partially ipsative format. The validation process was mainly focused on reliability and construct validity, with convergent and divergent validity of the Red, Blue and Green dimensions, compared to other psychological assessments. The construct validity processes described by Cronbach and Meehl (1955) and Campbell and Fiske (1959) guided us in describing the meaning of the categories. Face and content validity of the dimensions were partly neglected due to the lack of theoretical precision in the creation of categories and the improvised way of creating the specific items in the questionnaire in 1997 (Hegge, 1997). The consequential validity (Messick, 1995) of the categories had been documented in the area of marketing (Ekelund, 1997). More information about the descriptions of Red, Blue and Green with regard to the validity type is given later in this article.

In 2006, the first academic conference paper was presented (Ekelund & Langvik, 2006). Ekelund & Langvik (2008) edited a book integrating this and other academic conference presentations and other unpublished work including a practitioner's guide titled *How to run the classic seminar Diversity Icebreaker seminar*.

The book also included a chapter on the validation of the DI questionnaire in relation to well-established measurements like the Big Five personality dimensions – NEO-P-R (McCrae & Costa Jr, 1997); Emotional Intelligence – EQ-i (Bar-On, 1997), Emotional trait – TEIQue (Petrides & Furnham, 2001); Interpersonal Problems (Wiggins, 1979); MBTI (Rothausen & Ekelund, 2008); and cultural values (Ekelund & Langvik, 2008). A more precise description of the results can be found in the book edited by Ekelund and Langvik (2008).

The main results of these validation studies were that the dimensions of Red, Blue and Green could be partly explained by the personality traits theory, but most of the correlations were medium to low in the expected directions, even though there were some single exceptions for each of the concepts in the study. For example, the highest correlations between the three dimensions and the Big Five were observed between Openness to Experience and Blue,  $r=-.58$ ; and Openness to Experience and Green,  $r=.50$ ,  $p=.001$ ,  $N=251$  (Langvik, 2006). A replication study of the correlations between the Big Five model, personal values and Diversity Icebreaker dimensions conducted in Israel in 2011 confirms this conclusion. In this study, with  $N=101$  for personal values and  $N=158$  for Big Five dimensions, a regression analysis indicates that personality and personal values explain between 50% to 55% of the variance of Red, Blue and Green (Lilach et al, 2012). In relation to MBTI, only one high and positive correlation was observed between Intuition (S-N dimension) and Green,  $r=.67$ ,  $p=.001$ ,  $N=53$ . In relation to Bar-On emotional intelligence model (EQ-i) the highest correlation was observed between the Interpersonal Subfactor and Red,  $r=.33$ ,  $p=.001$ ,  $N=185$  (Langvik, 2006). In relation to the Interpersonal Problems model by Wiggins (1979), a study by Langvik (2006) yielded no correlations stronger than  $r=.33$  in general and none significant correlations with Green,  $N=133$ .

The few high correlations, and many low and non-significant ones, in relation to all other concepts tell us that the dimensions of the Diversity Icebreaker can only partly be explained through these concepts. The relative numbers of correlations with Diver-

sity Icebreaker dimensions that did not satisfy the significance criteria of  $p < .05$  is in relation to NEO-P-R: 8 out of 15; EQ-i: 34 out of 45, IIR: 19 out of 24 and MBTI; 4 out of 12. So, there is a lack of model that satisfies all three dimensions of Red, Blue and Green. This motivates a search for other types of scientific concepts, like for example cognition and a cognitive diversity model.

Due to the development of Red, Blue and Green as common sense categories and including only 121 of 161 ideas, it is assumed that the nature of the three categories is not meant to be an all-round description of all the facets of a given phenomenon as in, for example, the five dimensions of personality in the Big Five model (McCrae & Costa, 1997) and this might be one of the reasons why there are difficulties in finding converging validity between all the dimensions in the Diversity Icebreaker in relation to other psychological models. It also gives arguments for seeking other directions in search of what the Red, Blue and Green dimensions represent, and eventually what they together constitute as an overall model.

## **Face and content validity of Red, Blue and Green**

In 2006, when the first empirical validation analysis was summarised, Ekelund presented a workbook used as a supplement for participants in the seminars and as a guide for the consultants (Ekelund, 2006). In this workbook a description of each colour was presented based upon three different sources:

The first source was the questionnaire itself, where the colours were presented based upon key words in the 14 questions that indicated a reference to characteristics of people with such colour preference. For example Blue was described in the following way:

People with a strong Blue preference are concerned with being concrete and practical. They like to calculate and work towards solutions, in a systematic manner. They want things to be useful and serve a purpose. The aim of communication is to solve tasks

in a precise way. In decision making processes they want the facts to be presented and they measure the arguments in terms of usefulness and goal achievement. They are concerned with keeping the end result precise and all details correct.

This type of presentation draws upon face and content validity – the degree to which a measure looks like it measures what it was intended to in the eyes of participants – and whether the words refer to key words in the construct to be measured. Since the Red, Blue and Green model was created as a broad communicative strategy, and without an explicit replication of another model, the most precise content statements refer to the first version of the questionnaire.

The second source was the guidelines that were used in the design of the marketing campaign and the training of consultants in 1995. These contained ideas on how to approach the other person in communication in order to produce an impact on the consumer's energy consumption. The success of the campaign supported, what Messick called, its consequential validity (Messick, 1995). Below is an example from the "Blue guidelines":

- Be down-to-earth, practical, focus on usefulness
- Be logical, goal-oriented
- Use facts and examples
- Focus on details
- Use numbers and calculations
- Be structured and well prepared  
(Ekelund, DI-Manual, 2006, p5)

The third source was based on our first empirical studies that were extensively presented in the book on the Diversity Icebreaker in 2008 (Ekelund & Langvik). That presentation was based on ideas of establishing construct validity through measuring of

convergent and divergent validity, in other words, conducting a correlation analysis in relation to other psychological concepts (Cronbach & Meehl, 1955; Campbell & Fiske, 1959). Below is an extract from Ekelund & Langvik (2008) exemplifying statements based upon empirical results showing that there are high correlations between Blue and Conscientiousness in NEO-P-R and no positive correlations to any of the Emotional Intelligence EQ-i scales.

People with the Blue preference tend to think and consider the consequences before they say or do something concrete. They are good at being focused and goal oriented, with the purpose of completing a task. They are not socially dominant and do not talk about feelings much or get carried away by the world of imagination. They do not seek excitement for its own sake and are not carried away by torrents of positive emotion. Their everyday life is not characterised by impulsiveness and spontaneous suggestions are mostly seen as disturbance.

(Ekelund & Langvik, 2008, p 31)

Critique has been correctly raised regarding the lack of a precise definition of what the Red, Blue and Green dimensions are (they have been variously referred to as traits, dimensions, preferences, etc.) and scientific reference to established psychological concepts (Traavik, 2008). The application of these different labels has varied from personal qualities, communicative patterns, as well as preferences for particular team roles. As discussed above, the different empirical studies yielded medium to low correlations between the three dimensions of DI and other models, e.g. the Big Five. However, the Red, Blue and Green model itself has not been discussed well enough scientifically. The way the categories emerged in 1995 did not follow a scientific model of capturing personality or a broad and total spectrum of communicative behaviours. At the time, these common sense categories (Moscovici, 1984) were found useful for designing a manageable segmented marketing communication approach (Ekelund, 1997).

In an attempt to increase the quality of psychological measurement and defining more precisely the model and the three dimensions, three important groups of challenges emerge:

- a. The ipsative format, compared to Likert scales, raises issues that researchers and practitioners disagree about. Disagreement concerns applicability as well as recommendations regarding the use of statistical procedures when analysing data collected with measures using this format. Partially ipsative formats have not been documented in the literature except for confirming their status and inviting more research (Waszak, Laube & Deller, 2006). In that sense, the variance analyses of the Diversity Icebreaker data performed after 2005 might be understood as a trial of construct validity processes in the use of such a measurement format.
- b. Even though internal consistency is high in the Red, Blue and Green categories, there has not been any systematic attempt or intention to discard the items that load on more than one factor. This is due to the use of cluster analysis and the way the questionnaire was assembled the first time (Hegge, 1997). Sydorenko's thesis (2012) discusses the challenges of using different statistical methods validating categories that are not clearly distinct. She uses a Likert scale format for scoring in Red, Blue and Green in order to follow a scientifically acceptable way in using advanced variance analysis, like Exploratory and Confirmatory Factor Analysis. Even though her samples are small (Norwegian: N= 137, Germany: N=117, English: N=59) her conclusions on the factor structure confirm the challenge of overlapping items:

The obtained outcome is in line with the result of the Factor analysis for the whole data set, where Green and Blue items were often found within one factor, implying that some characteristics of Blue and Green dimensions cannot be strictly separated. (Sydorenko, 2012, page 79)

- c. In the process of extending the use of the Diversity Icebreaker into new cultures and using new languages, we have only applied a linguistic translation form and not an ecologi-



cal replication of the construct within the new culture and language (Berry et al, 2002). It was done this way due to the applied context of the local processes in creation of meaning of the Red, Blue and Green categories in workshops. A literal translation is probably the most widely known bi-lingual understanding among participants in the seminar. This has implications for cross-cultural comparisons of empirical data where it will be unlikely that the same items will load in the same way on Red, Blue and Green in different cultures. This is also confirmed in Sydorenko's (2012) comparison studies of Norwegian, German and English speaking samples. Whether there is a need for an alternative construct validation process is an empirical question that might lead to another type of practice in the future.

## **Historical summary and further steps**

There are clearly four successive stages in the developmental history of the Diversity Icebreaker:

The first one comprises the genesis of the categories and the successful use of the model in marketing and consultation (Ekelund, 1997). Further studies and practice in this area have not been initiated.

The second one involves the construction of the questionnaire and its use in the area of team roles and team-development (Ekelund & Jørstad, 2001). This particular context was the starting point of the commercial use of this concept.

During the third stage, the questionnaire was revised, which empirical validation studies possible (Ekelund & Langvik, 2008). It showed that only some, single dimensions from different psychological concepts converged with the Red, Blue and Green dimensions, but no entire models that were tested converged completely with the Red, Blue and Green model. This suggests that the Diversity Icebreaker concept is unique. There are, however,

unresolved statistical issues concerning the partial ipsative scores and the factor structure of Red, Blue and Green.

Finally, the fourth stage is about establishing connection between the learning styles and cognitive diversity concepts and the Red, Blue and Green model, in order to understand individual and collective processes in multicultural settings (Ekelund, Rossi & Van Egmond, 2010, Matoba, 2011). While there has not been any scientific continuation of the main ideas related to the genesis of Red, Blue and Green in the marketing campaign, the introduction of learning styles and cognitive diversity seems to share similarities with the early stages of the concept development. The question is whether these later perspectives might lead to another and more promising scientific platform for further research on the validation of Red, Blue and Green, both in relation to understanding individual processes and in teamwork. In order to lay the foundations for such a historical integration, the psychological area of cognition is suggested as an integrating platform – both in terms of the history of the concept and as a promising theoretical avenue for stimulating further research.

## **Cognitive approach to Red, Blue, and Green**

Neisser introduced the term *cognitive psychology* and described the cognitive processes as all processes, by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used (Neisser, 1967). Cognitive psychology today is a thriving area, dealing with a great diversity of phenomena, including topics like: attention, perception, learning, memory, language, emotion, concept formation, and thinking (Eysenck & Keane, 2000). However, it shares the same information processing approach and can be understood as a study of how people perceive, learn, remember, and think about information (Sternberg & Sternberg, 2012)

In Ekelund's (1997) work on creating the Red, Blue and Green model and the marketing campaign, this information processing approach was highly present but without a broader theoretical

cognitive perspective. In opposition to many other campaigns, behavioural change was in focus rather than attitudes, but Behm's Self-Perception theory legitimised this choice: if you can change behaviour, emotions and cognitions will adapt. The campaign focused on the process of problem solving, in which the customer was assisted by an advisor. Revisiting this history with the perspective of cognitive processes in mind could be one possible way to look at creating the Diversity Icebreaker model of Red, Blue and Green within the cognitive oriented psychological tradition. In order to rewrite the rationale of the marketing campaign and the other elements from the developmental history of the Diversity Icebreaker, a description of the distinct cognitive processes might prove helpful.

As aforementioned, there are many different fields of study within a scientific cognitive paradigm and there is no unison as to which elements ultimately constitute cognition, and where to draw the lines between them. In an attempt to systematically describe and investigate the DI concept from the cognitive perspective, we have arbitrarily chosen some most recurrent elements of cognition and those, which are also most relevant for the model. These are: a) attention, b) memory, c) producing and understanding language, d) solving problems, and e) making decisions.

- a. Attention can be described as an active processing of a limited amount of data from the vast amount of information available through the senses, in memory, and through cognitive processes; concentrating on a manageable subset of available stimuli (Sternberg & Sternberg, 2012). It refers to the selectivity of processing (Eysenck & Keane, 2000)
- b. Memory can be defined as all the means by which we retain and draw on our past experiences to use them when needed (Sternberg & Sternberg, 2012). It is studied as a structure (the way in which the memory system is organised) and a set of processes (mental activities present within this system) (Eysenck & Keane, 2000).

- c. Language comprehension can be understood as a set of cognitive processes that enable us to understand the meaning of utterances. Language creation, on the other hand, can be considered as a goal oriented activity – people use language to convey information, be friendly, etc. Therefore, social and emotional factors should also be taken into account here (Eysenck & Keane, 2000).
- d. Solving problems involves thinking directed towards a specific goal, i.e. finding a solution to a problem, and being conscious about its product (Eysenck & Keane, 2000). It is based on memory and reasoning, which itself could be understood as the process of drawing conclusions from principles and from evidence (Sternberg & Sternberg, 2012).
- e. Making decisions is different from reasoning and judgment in a sense that it is concerned with choosing among options, and can involve choices of personal significance (Eysenck & Keane, 2000). For example, it may involve choosing between the products of thinking: alternative solutions to a problem.

Below is an attempt to recount the history of the marketing campaign from 1995 to 1997 from the perspective of these five elements:

**Attention:** Access to consciousness is controlled by attention mechanisms in the same way as what appears on a television screen is determined by which channel is chosen (Eysenck & Keane, 2000). The first marketing campaign in 1995 was built upon the idea of “what arguments, words, perspectives and metaphors” would attract the attention of different segments in the population, in other words – how to present the information in order to make a person switch his or her attention and stay on the channel, on which it is presented. Ways of communicating were sought to first attract attention and initiate interaction, and later strengthen good and trustful communication to the purpose of influencing customer behaviour. Questions like: “What do people pay attention to?” and: “What kind of arguments and values are important for different segments?” were asked.

**Memory:** No specific memory studies linked to the Diversity Icebreaker categories have been carried out, but the theoretical model for the market campaign in 1995 served to create guidelines for advisors and train them to introduce the new arguments in a way that they would resonate best with the customers' already established structures of knowledge. For example, if a customer was identified as a person attracted by concrete information about how much energy exactly he or she would save by a technological change; an advisor could foresee that this person would best remember arguments that include numbers and concrete estimations (and other, "Blue types of information"). This is a well-known learning strategy in order to increase remembering (Rommetvedt, 1972).

**Producing and understanding language:** The market campaign made use of words and symbols that were perceived as attractive. Within trainings for consultation and written recommendations for customers, a variety of strategies was developed to meet the different expectations and preferences of people within the Red, Blue and Green groups, and to facilitate the process of language comprehension within these groups (Ekelund, 1997). These guidelines were later on integrated in different training programmes (Kaasa, 2003, Ekelund & Rydningen, 2008) and include recommendations for words and phrases to be used in relation to Red, Blue or Green. In this sense, the process of language creation in the campaign was a goal oriented activity.

**Solving problems:** The main challenge the consultation training in the marketing campaign faced, was how to make customers reduce energy in everyday consumption. Hence, the problem, which was to be solved, was entangled in the very aim of the whole initiative. The advisors' role was to facilitate the process of finding solutions to the problem of energy reduction that customers were involved in, by providing them with arguments and evidence.

**Making decisions:** In the original marketing campaign, the success criterion was reduction of energy consumption among consumers. In order to document the campaign's success it was

important to lead the customers towards making a decision to buy energy reduction tools or establish a new behavioural practice that led to a reduced energy consumption. The advisors' role was also to help the customers to choose among different, alternative solutions generated in the problem solving processes described above and decide on their implementation. Decision making on customer level was a central part of this process.

As presented above, all the processes that comprise cognition can be related to the marketing and consultation campaign from 1994. The terminological use of **cognition** for Red, Blue and Green, as it emerged in the marketing campaign, is legitimised through the examples listed above. For this reason it, we suggest to apply **the cognitive approach as central** in redefining the dimensions of Red, Blue and Green.

Red, Blue and Green have been described as relevant for team work (Ekelund & Jørstad, 2002). Information processing, problem solving and decision making are important aspects of most kinds of teamwork. Individuals have different preferences concerning the way they manage information and this often helps teams to overcome interpersonal challenges, as well as stimulate creativity in multicultural teams (DiStefano & Maznevski, 2000). Another well documented area – in the validation studies of the Diversity Icebreaker presented earlier (Ekelund & Langvik, 2008) – is the way personality and values influence cognitive processes and interactional preferences. Individual differences in these processes could be reflected in the perspectives that Sternberg and Zhang promote in some of their work on delineating and defining related style concepts, where they collapse everything into non-ability, non-personality concept called Intellectual Style:

(...) Intellectual Style is used as a general term that encompasses the meaning of all “style” constructs postulated in the literature, such as cognitive style, conceptual tempo, decision making and problem solving styles, learning style, mind style, perceptual style and thinking style. An intellectual style refers to one's preferred way of processing information and dealing with tasks.

To varying degrees, an intellectual style is cognitive, affective, physiological, psychological and sociological.

(Zhang & Sternberg, 2006, p.3)

By bringing this perspective about, they broaden the concepts used in both individual and social processes. Since Red, Blue and Green have emerged from the practice of marketing, communication, problem solving and behavioural change and, moreover, since they have been used in teamwork, it is relevant to have a broad perspective that integrates both individual and social processes. The use of the Diversity Icebreaker in multicultural settings also invites to explore the cognitive scripts as a way of understanding complex multicultural interactions.

A broader perspective on cognition, as described above, includes these facets and for this reason we can look at diversity in cognition as reflected in the categories of Red, Blue and Green. The *cognitive diversity* term has been suggested as a more functional entry point into dialogue, where a complexity of diversity elements among participants is at play (Matoba, 2011). This is in line with earlier statements presented in the multicultural context of the use of the Diversity Icebreaker (Ekelund & Maznevski, 2008). For this reason, it is justifiable to think of Red, Blue and Green in terms of the cognitive diversity. The section below gives an overview of completed or on-going research projects related to the Diversity Icebreaker, and which could be linked to various areas of cognition. Also, it delineates directions for further research of that kind.

First, we describe the Red, Blue and Green dimension from the attention and remembering perspectives, then from the perspective of producing and understanding language, followed by making decisions and problem solving. At the end, a perspective of learning styles – encompassing all elements of cognition – is presented.

**Attention and remembering:** A published research by Mæhle & Shneur (2010) used Red, Blue and Green as a simplified proxy for certain facets of human personality, which were then asso-

ciated with specific dimensions of brand personality – a set of human characteristics associated with a brand (Aaker, 1997). In their work they found that consumers prefer brands “with personalities” that match their own. For example, consumers with a Blue DI preference show clear aversion to the Excitement dimension of brand personality, whereas consumers with a Red DI preference exhibit a clear preference for the Sincerity dimension of brand personality.

Nonetheless, there has been no systematic research dealing explicitly with attention or perception processes discriminating between Red, Blue and Green in a laboratory setting.

**Producing and understanding language:** There are three interesting areas concerning how people create the meanings of Red, Blue and Green:

The first is mentioned by Ekelund, Davcheva and Iversen (2009, *ibid.*) suggesting that shared understandings of Red, Blue and Green emerge in small group discussions where the stimuli come from three sources: the items in the questionnaire, personal experience and social alignment in the group sense making of the concepts. However, although the classic DI seminars have been conducted repeatedly in the last few years in a way that imply such process taking place, no systematic study of it has been conducted.

The second study area addresses the issue whether this language continues to be used in communities, teams and organisations changes following the seminars. Do people communicate using the Red, Blue and Green categories when they exchange perspectives and give feedback? An early qualitative study of reports from four experienced consultants suggests this line of reasoning (Ekelund, Nordgård & Langvik, 2007). It shows that one of the six categories emerging from the grounded theory analysis (Strauss & Corbin, 1990) is “Offer a new language and



shared understanding to manage diversity”. Citations from an interview:

Typically, after we have run the DI in a group, then everybody walks around and talks about Blue, Red and Green, and that you are Blue, and I am Green and so on, in weeks after. It is really an eye-opener.

(Ekelund, Nordgård and Langvik, 2007)

Further, a qualitative research study in four organisations has been started (Brannen et al, 2012) to follow up in more depth the early results of the study from 2007.

The third area is related to the work of Kazuma Matoba and the concept of “third culture” (ibid.). According to this idea, individuals from two different institutional and cultural contexts become integrated in a new, hybrid culture created by them in the processes of social construction (Gergen, 1999); and which each of them can accept as a new part of her or his cultural identity.

In order to achieve this result, the focus at the beginning – according to Matoba – should not be on identity diversity (gender, age, ethnicity, nationality, physical conditions, sexual orientation, etc.) but rather on the cognitive diversity (how we see, predict, analyse, and interpret information), which, he states, is less likely to lead to prejudice and negative conflicts. The participants gain knowledge about this cognitive diversity and learn how to use it, when they define the meaning of each colour in the social processes taking place in the seminar (Red, Blue and Green are treated by Matoba as a model of cognitive diversity). At the same time, they acquire a new, shared language of Red, Blue and Green, which enables them to discuss their cognitive differences as well as other diversity issues in their new “third culture”.

Matoba reports that the use of the Diversity Icebreaker in his teaching and introduction of the language of Red, Blue and Green seems to create a shared cognitive diversity model among the

students that makes identity and informational diversity manageable in a less conflicting way (Matoba & Ekelund, 2011).

Matoba states that the introduction of this type of difference immediately leads to integration. While the diversification takes place at the individual level, the unification is done collectively. This is a model relevant for the social construction of language in groups, relevant for “third culture building”, as well as classroom cultures for multicultural student groups mentioned earlier in this article.

**Making decisions:** Informal feedback indicates that people find it easier to discuss divergent perspectives within the metaphorical structure of Red, Blue and Green. Structured techniques for decision making using individual and group processes have been reported by consultants using the concept. Nonetheless, there are no qualitative studies that have documented similar organisational experiences and no experimental studies have investigated the effect of introducing Red, Blue and Green in decision making processes. Further research is needed both within an experimental design and in regard to qualitative studies of organisations.

**Solving problems:** The first experimental trials of problem solving in groups with designated Red, Blue and Green combinations have been done as student work by Felix Block in 2012 (Block, 2012). The main objective of this project was to develop an observation scoring structure and to test it through a video study. Further exploratory developments here might lead to promising investigation on individual contributions and group problem solving – both of the application areas for DI in teams (Ekelund, 2009c) and other team role concepts (Margerison & McCann, 1991, Belbin, 1981).

Another research possibility is conducting correlation studies in relation to other concepts similar to Red, Blue and Green that have a documented influence on problem solving. Post (2011) presented a study where she differentiated preferences for problem solving approaches in two categories of the connective and se-

quential thinking styles, reflecting following dilemmas: detail vs. whole and local vs. global. The connective thinking style is a preference for considering many factors at once and linking previously unconnected ideas. The sequential thinking style, on the other hand, is characterised by a preference for following an existing set of logical, sequential routines to find a solution to a problem (Jabri, 1991). This idea was also applied to teams where the team cognitive style is understood as an average preference in cognitive functioning pooled from individual members' styles. The notion of cognitive style mobility can be applied to teams, and since each of the thinking styles corresponds to the key components of the innovation process, it is reasonable to predict that teams capable of shifting styles (cognitive style mobility) and using all of their members' perspectives will perform better (Post et al, 2009).

In an unpublished study using Post's measure of the two problem solving approaches (Pluta & Ekelund, 2011) and the Diversity Icebreaker questionnaire, there were significant, positive correlations observed between the connective thinking and Green,  $r=.56$ ,  $p=.001$ ,  $N=106$ ; and between the sequential thinking and Blue,  $r=.44$ ,  $p=.001$ ,  $N=106$ . As expected, these results confirmed that at least two of the dimensions of the Diversity Icebreaker are closely related to corresponding styles of problem solving in Post's model. However, no clear relation between the Red dimension and either of the thinking styles was observed. This might have occurred because the Red dimension is focused more on interaction and practice, where the dialogue is more important. The Red component seems also to show face validity similar with what we find in Sternberg's (1988) practical intelligence, Gardner's (1991) practical and social intelligence and in Bar-On's (1997) emotional intelligence.

**Learning styles:** the term refers to the notion that individuals differ with regard to what way of acquiring knowledge is most effective for them (Pashler et al, 2009).

In 1997, when the first questionnaire was developed to identify respondent preferences for Red, Blue and Green, we were inspired by questionnaires like MBTI, but also by more learning

oriented concepts created by Gardner (1993), Honey & Mumford (1992). However, when the concept was presented in 1998 and in the following years, the notion of learning styles was not being mentioned or explored. A revisiting of the working documents from this period suggests an initial differentiation of learning styles with regard to Red, Blue and Green in the following way:

**Table 1**

*A differentiation of learning styles in regard to Red, Blue and Green.*

Red	Blue	Green
Discussions	Numbers	Conceptual
Emotional	Lists	Mind Map
Role Play	Figures	Intuitive
Active	Analysis	Figures
Relevance	Sensing	Reflecting
Context	Sequential	Perspectives
	Deductive	Abstract
	Concrete	

This perspective got a renewed attention when the “Diversity Manager” at Jacobs University in Bremen, Alexis Rossi, suggested using the Diversity Icebreaker as a tool for establishing a more functional learning culture in their multicultural classrooms. The increasing number of international students in higher education in Europe (Kühnen et al, 2009) poses a kind of challenge similar to the one encountered in multicultural organisations (Lane et al. 2004), for example, different expectations concerning openness, involvement, discourse, feedback and authority found in different cultures (Schneider & Barsoux,1979).

The Diversity Icebreaker has been used in cross-cultural training in organisations in order to develop the competence to manage diversity in areas that are not culturally based (Ekelund & Maznevski, 2008). The idea has been to train employees and

managers to manage interpersonal diversity between Red, Blue and Green – and then use this experience as a platform for managing interaction between people with different cultural values.

Alexis Rossi raised the question whether DI could be applied as a tool for creating a shared understanding of individual level preferences for learning styles in the classroom. This would be especially attractive for student groups where group and project work is an important part of the learning and grading processes of the students' competence. There are some significant correlations between Red, Blue and Green and cultural values (Ekelund, Shneor & Gehrke, 2008). A study dedicated to culturally influenced learning beliefs and Red, Blue and Green has shown cross-cultural variations on the level of correlations between Red, Blue and Green compared to a western learning belief labelled Mind, and an eastern learning belief named Virtue (Ekelund, Rossi & Van Egmond, 2010; Rossi, Van Egmond & Ekelund, 2011).

The application of the learning styles model to multicultural student groups justifies extending the studies to different cultural contexts to investigate cultural values and culturally based learning beliefs, both for research and for practical purposes in order to avoid reinforcing cultural differences or drawing new fault lines (Lau & Murningham, 1998) that strengthen the inter-sections in student groups.

It has to be noted that the learning styles notion has been criticised recently (Pashler et al, 2009; Riener & Willingham, 2010), but it is nonetheless interesting to think of Red, Blue, and Green as an alternative concept. First, because it emphasises the non-orthogonality of styles, which enables individuals to have mixed styles and facilitates between-style mobility. Second, because unlike most applications of the learning styles concept, which are focused on diagnosing the individual's preferences and adjusting instructions and material to match them, the Diversity Icebreaker aims at enhancing not only individual but also collective learning, by making individuals aware of styles of the others as well.

## Discussion

What are the categories of Red, Blue and Green? Originally, the focus groups in 1995 were asked to generate examples of communicative behaviour that could influence other people's decision making concerning consumption of energy. Although we have reasons to believe that ordinary people find it easy to project different communicative behaviours into these categories and understand them, it does not imply that this is equally easy to understand or document the relation between Red, Blue, and Green and other, well established psychological concepts.

Different concepts have been considered in relation to the Diversity Icebreaker since 1995, among them personality, personal values, team-roles and learning styles. The results of studies conducted with regard to these concepts since 2005 lead to a conclusion that they can only in part explain Red, Blue and Green measured by the Diversity Icebreaker questionnaire.

The introduction of the cognitive approach perspective to the development of the Diversity Icebreaker concept, as well as to the structure of the Red, Blue, and Green model, is promising and could potentially establish a better platform for further research.

The history of the concept is revisited in order to connect early developmental work with various cognitive processes. Furthermore, an overview of research and observations with regard to the Diversity Icebreaker concept, which could be classified as pertaining to the cognitive approach, is given. However, not all elements of cognition have received equal attention – some seem to be worth further investigation.

For example, the unpublished study using Post's questionnaire measuring two thinking styles, confirmed the converging validity of Blue and Green with the sequential and connective thinking styles respectively, but provided no knowledge about the Red dimension in this regard.

In her original study, Post (2011) concluded that the team cognitive composition strongly influences its level of innovativeness and a relevant research project would be to see which of the two models – Post’s or the Diversity Icebreaker – can most successfully, in statistical terms, predict group processes with regard to creativity and innovation at team level. In the manual of the Team Performance Inventory (TPI), unpublished results on 21 teams measured with TPI and with the Diversity Icebreaker (all members of the teams assessed both TPI and DI) indicate a regression line that Green predicts Innovation, while Blue yields a negative effect (Ekelund, 2009b). Even though these data are not statistically significant, they point to the same type of converging validity due to similarities in predicting Innovation at team level. This strengthens the convergent validity of the idea that these constructs are overlapping.

However, in the Diversity Icebreaker, there is a third dimension – Red. The same manual reports that the Red’s regression line seems to have an even stronger positive impact on Innovation compared to Green (Ekelund, 2009b). The social dimensions of teamwork seem to be a prevalent issue in Scandinavian management (Ekelund, 2009a). Is the Red dimension a culturally specific phenomenon in Scandinavia?

Another trilemma partition of cognitive preferences, which could help explain the phenomenon of Red, is found in the work of Zhang (2008). As a result of factor analysis, she grouped Sternberg’s thirteen Thinking Styles into three types: 1) creative, reaching higher levels of complexity; 2) norm favouring tendency, lower levels of cognitive complexity; 3) multitasking, working on “whatever comes along”. From the perspective of content validity analysis, we have reasons to believe there is a similarity between Zhang’s proposition and Red, Blue, and Green. Will this model, integrating the more social dimensions, be even better for predicting team innovation? In which contexts are these social dimensions of problem solving and Red more important?

Further research is needed and will potentially add value to the Diversity Icebreaker questionnaire as a measure of cog-

nitive diversity model and its predictive qualities for innovative teamwork.

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