Situational Outlook Questionnaire℠

Development of the SOQ

A Technical Resource

Scott G. Isaksen
Göran Ekvall

© 2015 Scott G. Isaksen. All rights reserved.
The Situational Outlook Questionnaire® and its logo are registered trademarks of Scott G. Isaksen. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the author.

Published by Better Change Tools.

Introduction

The purpose of this technical summary is to document the development of the Situational Outlook Questionnaire® (SOQ) from its initial translation of its Swedish precursor, the Creative Climate Questionnaire (CCQ) through to the next most current version. The psychometric properties of the current version can found in a separate technical resource.

Ekvall had developed numerous versions of the original Swedish questionnaire in an effort to continuously improve the item and scale performance. We have followed his tradition in an effort to strengthen the item to scale performance, factor structure, and dimension clarity.

This resource starts with an explanation of how the SOQ has been transformed into a multi-method assessment through the addition of three open-ended questions allowing the respondents to provide narrative responses. Although the nine dimensions of the SOQ are clearly focused on the assessment of the climate for creativity, innovation, and change, the addition of these open-ended questions allow the respondent to identify other factors in the broader work environment that may be salient within their particular context. We believe that this is a unique aspect of the SOQ.

The next major section of this resource reports the results from translating Ekvall's original Swedish CCQ into English.

Finally, the technical development and results from each version of the SOQ are reported.

List of Tables

Table 1 Group Make-Up: Subjects and Frequency Percentages for CCQIA 38

Table 2 CCQIA Item Norms: Means and Standard Deviations 40

Table 3 CCQIA Scale Norms: Means and Standard Deviations 41

Table 4 Inter-Correlations among CCQIA Challenge/Motivation Items for Overall Sample (n = 419) 46

Table 5 Inter-Correlations among CCQIA Freedom Items for Overall Sample (n = 419) 46

Table 6 Inter-Correlations among CCQIA Idea-Support Items For Overall Sample (n=419) 47

Table 7 Inter-Correlations among CCQIA Dynamism/Liveliness Items for Overall Sample (n = 419) 48

Table 8 Inter-Correlations among CCQIA Playfulness/Humor Items for Overall Sample (n = 419) 48

Table 9 Inter-Correlations among CCQIA Debate Items for Overall Sample (n = 419) 49

Table 10 Inter-Correlations among CCQIA Trust/Openness Items for Overall Sample (n = 419) 50

Table 11 Inter-Correlations among CCQIA Conflict Items for Overall Sample (n = 419) 50

Table 12 Inter-Correlations among CCQIA Risk-Taking Items for Overall Sample (n = 419) 51

Table 13 Inter-Correlations among CCQIA Idea-Time Items for Overall Sample (n = 419) 52

Table 14 Inter-Correlations among CCQIA Scales for Overall Sample CCQIA Dimension (n = 433) 53

Table 15 Results of Principal Component Analysis of CCQIA Items: (N = 419) 54

Table 16 Alpha Coefficients for CCQIA Scales 55

Table 17 Group Make-Up: Subjects and Frequency Percentages for CCQIIA 59

Table 18 CCQIIA Item Norms: Means and Standard Deviations 61

Table 19 CCQIIA Scale Norms: Means and Standard Deviations 62

Table 20 Distribution of Scores: Risk-Taking 63

Table 21 Distribution of Scores: Idea-Time 63

Table 22 Distribution of Scores: Play/Humor 64

Table 23 Distribution of Scores: Debate 64

Table 24 Distribution of Scores: Trust/Openness 64

Table 25 Distribution of Scores: Conflict 64

Table 26 Distribution of Scores: Challenge 65

Table 27 Distribution of Scores: Freedom 65

Table 28 Distribution of Scores: Dynamism 66

Table 29 Distribution of Scores: Idea-Support 66

Table 30 Inter-Correlations Between Dimensions of the CCQ IIA (n = 1844) 67

Table 31 Principal Component Analysis of CCQ IIA Items (Varimax Rotation): Entire Sample (n = 1831) 70

Table 32 CCQIIA Reliability 72

Table 33 Sources of Support for Ekvall's Dimensions of Creative Climate 74

Table 34 Group Make-Up: Subjects and Frequency Percentages for CIQIIIA 80

Table 35 CIQIIIA Scale Norms: Means and Standard Deviations 81

Table 36 Distribution of Scores: Risk-Taking 82

Table 37 Distribution of Scores: Idea-Time 82

Table 38 Distribution of Scores: Debates 83

Table 39 Distribution of Scores: Playfulness/Humor 83

Table 40 Distribution of Scores: Conflicts 84

Table 41 Distribution of Scores: Idea-Support 84

Table 42 Distribution of Scores: Challenge 85

Table 43 Distribution of Scores: Freedom 85

Table 44 Distribution of Scores: Dynamism 85

Table 45 Distribution of Scores: Trust/Openness 85

Table 46 Inter-correlations Between Dimensions of the CIQ IIIA (n=1297) 86

Table 47 Principal Component (Varimax Rotation) Analysis of CIQIIIA Items 88

Table 48 Maximum Likelihood (Oblimin Rotation) Analysis of CIQIIIA Items Component (n= 1297) 90

Table 49 CIQ IIIA 92

Table 50 Sources of Pressure in Your Job 93

Table 51 Pearson Correlations between Stress and Perceptions of Climate.
Climate Dimensions (n= 202) 94

Table 52 Work Environment Scale 96

Table 53 Climate Dimensions and Social Environment Factors 98

Table 54 CIQIIIA Reliability: Some Items Removed (n = 1250) 103

Table 55 Reliability of the SOQ Derived from Modifications of the CIQIIIA (n = 1250) 104

Table 56 Dimensions of Creative Climate Assessed by the Situational Outlook Questionnaire® 106

Table 57 SOQ 4 Item Norms: Means and Standard Deviations 109

Table 58 SOQ 4 Scale Norms: Means and Standard Deviations 110

Table 59 Distribution of Scores: Risk-Taking 111

Table 60 Distribution of Scores: Trust/Openness 112

Table 61 Distribution of Scores: Idea Time 112

Table 62 Distribution of Scores: Challenge/Involvement 113

Table 63 Distribution of Scores: Freedom 113

Table 64 Distribution of Scores: Idea-Support 114

Table 65 Distribution of Scores: Debate 114

Table 66 Distribution of Scores: Playfulness/Humor 114

Table 67 Distribution of Scores: Conflict 114

Table 68 Inter-Correlations Between Dimensions of the SOQ 4 (n = 639) 116

Table 69 Principal Component (Varimax Rotation) Analysis SOQ version 4 (n = 639) 118

Table 70 Maximum Likelihood (Oblimin Rotation) Analysis SOQ version 4 (n = 639) 120

Table 71 SOQ 4 Reliability 122

Table 72 Means, Standard Deviations, and Cronbach's alpha (n = 1111) for Dimensions of the SOQ.....125

Table 73 Principal Axis Factor Analysis (Oblique Rotation) Analysis SOQ version 5 (n = 1111).....126

Table 74 SOQ Item Norms: Means and Standard Deviations.....129

Table 75 SOQ Scale Norms: Means, Standard Deviations, and Standard Error.....130

Table 76 SOQ V 6 Internal Reliability: Some Items Removed.....131

Table 77 Distribution and Performance of Items: Challenge/Involvement.....132

Table 78 Distribution and Performance of Items: Freedom.....132

Table 79 Distribution and Performance of Items: Trust/Openness.....133

Table 80 Distribution and Performance of Items: Idea-Time.....134

Table 81 Distribution and Performance of Items: Playfulness/Humor.....134

Table 82 Distribution and Performance of Items: Conflict.....135

Table 83 Distribution and Performance of Items: Idea-Support.....136

Table 84 Distribution and Performance of Items: Debate.....136

Table 85 Distribution and Performance of Items: Risk-Taking.....137

Table 86 Correlations among SOQ Challenge/Involvement Items for Overall Sample (n = 4730) α= .8619.....138

Table 87 Correlations among SOQ Freedom Items for Overall Sample (n = 4730) α= .8296.....138

Table 88 Correlations among SOQ Trust/Openness Items for Overall Sample (n = 4730) α= .6919.....139

Table 89 Correlations among SOQ Idea-Time Items for Overall Sample (n = 4730) α= .8666.....139

Table 90 Correlations among SOQ Playfulness/Humor Items for Overall Sample (n = 4730) α= .8808 140

Table 91 Correlations among SOQ Conflict Items for Overall Sample (n = 4730) α= .8556 140

Table 92 Correlations among SOQ Idea-Support Items for Overall Sample (n = 4730) α= .8912 141

Table 93 Correlations among SOQ Debate Items for Overall Sample (n = 4730) α= .8833 141

Table 94 Correlations among SOQ Risk-Taking Items for Overall Sample (n = 4730) α= .7934 142

Table 95 Inter-Correlations Between Dimensions of the SOQ (n = 4730) 143

Table 96 Descriptive Statistics – Female 144

Table 97 Descriptive Statistics - Male 144

Table 98 ANOVA on Differences in Gender 145

Table 99 Correlation SOQ Dimensions & Age (n = 2863) 146

Table 100 Correlation SOQ Dimensions & Age Ranges 147

Table 101 ANOVA on Differences in Age Intervals 148

Table 102 SOQ Comparison between On-line and Paper Editions (n=19, Overall Correlation = .92) 150

Table 103 SOQ Comparison between On-line and Paper Editions: ANOVA 151

Table 104 Descriptive Results 153

Table 105 Cronbach's alpha for four samples 154

Table 106 ANOVA Results 155

Tabe 107 Principal Component (Promax Rotation) Analysis SOQ version 6 items (n = 4730) 159

Table 108 Characteristics of Creative Products....161

Table 109 Pearson Correlations between Perceptions of Climate and Products Climate Dimensions (N = 141a)....162

Table 110 Significant Differences in Climate for High and Low SCIP Scores....164

Table 111 Examining Recognition Rewards and Creative Climate....168

Table 112 Mean Scores for Best and Worst Case Situations....170

Table 113 Comparison of Mean Scores for Worst-Case Situations....171

Table 114 Comparison of Mean Scores for Best-Case Situations....172

Table 115 Analysis of Differences Between Best and Worst Case....173

Table 116 Descriptive Statistics n=71....175

Table 117 Comparison of Mean Scores for Best-Case Situations – Student Dataset....176

Table 118 ANOVA on SOQ Best/Worst (n = 71)....177

Table 119 Descriptive Statistics SOQ (n = 174)....179

Table 120 Comparison of mean scores: best and worst-case....180

Table 121 Univariate F Test Between Best-Case and Worst-Case Scores; SOQ Dimension....181

Table 122 Descriptive Statistics SOQ (n=27)....182

Table 123 Comparison of Mean Scores for Best and Worst-Case Situation....183

Table 124 Univariate F Test: Best and Worst-Case SOQ Scores; SOQ Dimension....184

Table 125 SOQ & KAI Means and Standard Deviations - Males/Females....189

Table 126 KAI/SOQ Correlations 190

Table 127 SOQ & KAI Means and Standard Deviations - Adaptors/Innovators 191

Table 128 Discriminant Function Analysis & Percentage of Classification. SOQ & KAI Wilks' Lambda (U-Statistic) and Univariate F-Ratio (n=416) 192

Table 129 Descriptive statistics VIEW/SOQ 202

Table 130 Descriptive Statistics View/SOQ for Males and Females 203

Table 131 View/SOQ Correlations 204

Table 132 Descriptive Statistics – Stronger Explorer/Stronger Developer 205

Table 133 Discriminant Function – Stronger Explorer/Stronger Developer. Tests of Equality of Group Means (Orientation To Change) 206

Table 134 Descriptive Statistics – Stronger Internal/Stronger External 207

Table 135 Discriminant Function – Stronger Internal/Stronger External. Tests of Equality of Group Means (Manner Of Processing) 208

Table 136 Descriptive Statistics – Stronger Person/Stronger Task 209

Table 137 Discriminant Function – Stronger Person/Stronger Task. Tests of Equality of Group Means (Ways Of Deciding) 210

Table 138 Descriptive Statistics VIEW 212

Table 139 VIEW Distribution for Orientation to Change 212

Table 140 VIEW Distribution for Manner of Processing 213

Table 141 View Distribution for Ways of Deciding 213

Table 142 Correlations: SOQ and VIEW in the Best-case Situation 214

Table 143 Correlations: SOQ and VIEW in the Worst-case Situation 215

Table 144 Means for OC and SOQ: Best-case Situation 216

Table 145 Means for OC and SOQ: Worst-case Situation 216

Table 146 ANOVA on SOQ dimensions and OC 217

Table 147 Means for MP and SOQ: Best-case Situation 218

Table 148 Means for MP and SOQ: Worst-case Situation 219

Table 149 ANOVA on SOQ Dimensions and MP 220

Table 150 Means for WD and SOQ: Best-case Situation 221

Table 151 Means for WD and SOQ: Worst-case Situation 222

Table 152 ANOVA on SOQ Dimensions and WD 223

Table 153 SOQ Means and Standard Deviations Sorted by Support of the Immediate Work Environment to Personal Creativity With Results of one-way ANOVA'S Between Groups* 228

Table 154 Ten Leading Marketplace Challenges 230

Table 155 Ten Leading Management Challenges 231

Table 156 Averages of the Most and Least Creative Team Responses (n =154) 241

Table 157 Tests of Significance on the Most and Least Creative Team Responses (n = 154) 242

Table 158 SOQ Team Results from Destination Imagination Secondary Teams (n = 30) 247

Table of Contents

Taking a Multiple-Method Approach 15

- Assessing Climate: Our Initial Approach 15
- Rationale for using a Multi-method approach to assessing climate 16
- Assessing Climate: Our Multi-method approach 19
- Evolution of Narrative Questions 20
- Research Frameworks for the Development of SOQ Narrative Questions 21
- Research Framework: Level I 22
- Research Framework: Level II 22
- Research Framework: Level III 23
- Programmatic Analysis Considerations 23

Using Our Research Framework To Drive Analysis Of Narrative Data 24

- Analysis Design and Implementation 24
- Level I Analysis: Unique Considerations and Characteristics 26
- Level II Analysis: Unique Considerations and Characteristics 26
- Level III Analysis: Unique Considerations and Characteristics 27

Qualitive Studies 27

- Cross-site Analysis 27
- Style and Climate 30
- Vision and Leadership Behavior 32

CHAPTER 2

The Translation of the CCQ 34

Creative Climate Questionnaire IA (CCQ IA) 34

- CCQ IA Design 34
- CCQ IA Procedures 35
- Subjects for CCQ IA 35
- Analysis of the CCQ IA 39
- Correlational Analysis of CCQ IA 45
- Factor Analysis of the CCQ IA 53
- Internal Consistency of CCQ IA 55

Creative Climate Questionnaire IIA (CCQ IIA) 56
CCQ IIA Design 57
CCQ IIA Procedures 57
Distribution of Scores 62
Correlational Analysis of the CCQ IIA 67
Factor Analysis of the CCQ IIA 68
Internal Reliability of the CCQ IIA 71
Content Validity of the CCQ IA AND IIA 72

CHAPTER 3

Climate for Innovation Questionnaire 77
Psychometrics of the CIQ IIIA 78
Procedures 78
Subjects 79
Distribution of Scores 81
Correlational Analysis 86
Factor Analysis 87
Internal Reliability 91

Validity of the CIQ IIIA 92
Creative Climate and Stress 92
Creative Climate and Social Environment 95

CHAPTER 4

Earlier Versions of the SOQ 101

SOQ Version 4 (1994) 101
Development 102
Design 104
Procedures 107
Subjects 107
Distribution 111
Inter-Dimension Correlations 115
Factor Analysis 116
Internal Reliability 121

SOQ VERSION 5 (1998) 123
Sample 123
Development 123
Results and Discussion 124

SOQ VERSION 6 (2001) 128
Distribution and Performance of Items 131
Inter-item Correlations 137

Inter-Dimension Correlations 142
Gender Differences 143
Age differences 145
Stability of Forms: Comparison of On-Line Paper Edition 148
Evidence of Stability over Time 152
Validity 156
Evidence based on Internal Structure 156

Evidence Based on Relations to Other Variables 160
Creative Climate, Suggestions, Recognition, Awards and Creative Performance 160
Creative Climate and Best/Worst-Case Scenarios 169
Study 1 169
Study 2 173
Study 3 177
Study 4 181
Creative Climate and Indidual Differences 184
Study 1A: The Initial Study 185
Study 1B: Follow up to the First Study 187
Study 2: First Use of VIEW 198
Study 3: Replication of SOQ and VIEW 211
Discriminating Levels of Perceived Support for Creativity 224
Discriminating Cimates for Creative Teamwork 229
SOQ Team Version 246

References 249

CHAPTER 1
TAKING A MULTI-METHOD APPROACH

The purpose of this chapter is to highlight a unique development of the Situational Outlook Questionnaire® (SOQ). Rather than focusing on either a quantitative or qualitative approach to understanding the climate for creativity, innovation and change, the SOQ embraces both methods. Reichers and Schneider (1990) supported this development as a means to deal more effectively with the evolution of the constructs of climate and culture.

Assessing Climate: Our Initial Approach

In 1981, the Climate for Creativity Questionnaire (CCQ) was developed by Ekvall to measure organizational climate for creativity and innovation. Over the next ten years, based on applied research and psychometric testing, this instrument went through numerous changes including its translation into English in 1986. Research continued with a new version based on evidence for the validity and reliability of its dimensions a few years later in 1989. As with all previous versions, the questionnaire measured defined dimensions relating to organizational climate using a quantitative approach.

While opening a series of climate questionnaires that had been mailed in for scoring in the early months of 1991, an unexpected critical event occurred. One of the participants wrote a great deal of notes on the questionnaire he had returned. He was one of a few hundred participants in a project with a Fortune 100 technology company, and the only one who chose to write all over the questionnaire. At first, we were stunned and a little concerned that someone had taken the time to write so many comments. The participant stated that although he understood what it was we were trying to measure; he thought that we should know some other critical bits of information.

After reading the comments provided by the participant, we recognized an inherent conceptual and practical opportunity provided by such a response. The additional feedback not only helped us deepen our understanding of organizational climate, but also broadened the usefulness of the instrument for participants and clients. To that end, we discussed the incident and designed an initial set of questions and a potential format to meet our needs for future theoretical development and practical use.

Rationale for Using a Multi-method Approach to Assessing Climate

Although our initial methodological approach was purely quantitative, we were able to see the value of adding a qualitative part to the climate assessment. We knew that there were inherent differences between quantitative and qualitative research and inquiry. In fact, these two different approaches to scientific inquiry have been at odds with each other for quite some time. We do not see any inherent difficulty in combining these two approaches in order to obtain broad comparisons and depth of understanding.

It was no surprise that Ekvall's years of experience with studying idea suggestion schemes and other personnel or administrative procedures or initiatives led him to the consistent discovery of the importance of climate. Likewise, we saw great potential in taking an approach that would allow us to use quantitative and qualitative approaches.

The possibility of adding narrative questions fit our larger research and development goals of contributing quality instrumentation to the field of creativity or improving existing instrumentation whose concepts we believed to be useful. They were also unique in purpose, design, and function.

In regard to unique purpose, we viewed the narrative responses as a part of the instrument itself, rather than as an add-on. Given Ekvall's initial theoretical conception of climate and its subjective-objective assumptions (1987), inclusion of

the narratives as a part of the instrument was a logical and useful extension. They provided verbatim comments from participants that could be used to either: elaborate, supplement, or clarify numerical results; or to identify and describe emergent constructs that were directly grounded in each specific context. In a sense, these questions allowed us to contextualize the quantitative results.

Taking into account participants' own words provided a logical extension of data that could be used across the range of a variety of assumptive modes described by Goetz & LeCompte (1984) and LeCompte & Preissle (1993) as critical in research design. These assumptive modes include: inductive-deductive, subjective-objective, generative-verificative, and constructive-enumerative.

Inductive-Deductive. From the perspective of the inductive-deductive mode of inquiry, the inductive approach starts with the data, and then builds relationships and theory. The deductive approach starts with some sort of theoretical system or framework and then develops hypotheses, propositions and concepts and attempts to collect data to support or reject these. Taking a multi-method approach allows us to take both an inductive and deductive approach to understanding the psychosocial conditions within organizations.

Subjective-Objective. When it comes to the subjective-objective mode of inquiry, the subjective approach centers upon the reality of the participant. In other words, the perceptions of the participants are the basis for understanding the working climate. From the objective point of view, the organizational climate exists; it is a concrete reality within the organization. People who are observers of the environment can describe it and complete assessments that evaluate certain characteristics of that environment. Taking a multi-method approach allows the participants to function as observers and answer predetermined questions that relate to the nine dimensions of the SOQ. It also allows them to share a deeper description of what the reality of the climate is like for them.

Generative-Verificative. From the point of view of the generative-verificative mode of inquiry, adding narrative questions allows for the discovery of constructs or propositions, as well as for the participant to share a variety of sources of data. This data supplements the data generated from the quantitative section of the SOQ. The closed-ended questions are preset and allow the participants to verify or confirm the extent to which they exist in their working climate.

Constructive-Enumerative. Finally, from the perspective of the constructive-enumerative mode of inquiry, the closed-ended questions focus on previously defined dimensions of climate and provide a numeric score. The narrative questions allow for the discovery of new constructs based on participant description. Taking a multi-method approach allows for the consideration of both kinds of inquiry.

Using qualitative data and assumptions in tandem with numerical results allowed more flexibility in methodological choices than is generally found in most research designs.

The combination provided a framework for identifying methodological appropriateness of both numeric and narrative data within each of these assumptive modes.

In considering the narrative questions and responses as an integral part of the instrument, we maintained that we also strengthened the quality of the research data received and the quality of output participants received. In taking this stance we attempted to make a practical "marriage" of two research paradigms-so-called 'quantitative' and 'qualitative,' whose uneasy relationship in the research community was metaphorically satirized by Gage (1989) as the "paradigm wars."

The concept of the importance and use of multiple methods to reflect multiple perceptions of a situation is neither new nor unusual in qualitative traditions (Brewer & Hunter, 1989). Denzin & Lincoln (1994) noted that, generically:

Qualitative research is multi-method in focus, involving an interpretative, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them (p. 2).

They further asserted that qualitative research uses a variety of empirical materials and inter-connected methods to better understand the subject matter.

The quantitative approach to the behavioral and social sciences includes a variety of defined methods and procedures, many of which you will see illustrated in the sections of this manual. The qualitative approach also includes a rich variety of methods and procedures (Denzin & Lincoln, 2005; Huberman & Miles, 2002). It seemed quite natural to take full advantage of both of these approaches to inquiry.

This new multi-method approach to measuring climate took full advantage of the power of qualitative analysis, which provides the richness and depth of response, and quantitative analysis that helps provide outputs that can be measured and generalized through statistical analysis.

Assessing Climate: Our Multi-Method Approach

The current design of the SOQ includes two parts. Part A includes 53 closed-ended questions that allows the use of quantitative data as the method of analysis to:

- Provide a concise description of an organization's climate in detail using statistical analysis
- Identify and test the relationships that exist between climate variables
- Provide an output that can be used to easily compare the findings to other organizations, leaders and teams

Part B includes three open-ended questions requiring narrative responses. These questions allow the use of a qualitative approach as the method of analysis to:

- Provide more depth of understanding of how each of the nine dimensions is playing out in the specific context under examination
- Reach a deeper level of meaning of the context, beyond the nine dimensions

- Help identify priorities for change that may have the greatest impact on the organization's climate needing attention

Evolution of Narrative Questions

The narrative section of the SOQ contains three questions that provide data on participants' perceptions of what helps or hinders their creative climate and elicits comments on what they might do to change the environment. The design of the questions was deliberately built on the early force field concepts identified in the work of Lewin (1951). Those things that help and hinder were placed in direct contrast to each other to bring out data about positive and negative tension points within the organizational context. This approach, although similar to Amabile and Gryskiewicz's (1988) stimulants and obstacles method, was intended to be on going and developmental.

We also wanted a consistent "barometer" of context on which to anchor recommendations or actions. To that end, we added an additional question to elicit suggestions reflecting participant ownership that asked what they might do to make the climate more productive themselves (Isaksen, Dorval, & Treffinger, 1994; 2000; 2011). This question was designed to mediate the initial force field with participant ideas for action.

Taken together, the three narrative questions provided a triangulated view of the context (Denzin, 1978) and an initial task appraisal (Isaksen, Dorval, & Treffinger, 1994) of it as well. The narratives thus strengthened and integrated the intervention function of the instrument.

The three narrative questions are:

- What aspect of your working environment is most helpful in supporting your creativity?
- What aspect of your working environment most hinders your creativity?
- What is the most important action you would take to improve the climate for creativity in your working environment?

Research Frameworks for the Development of SOQ Narrative Questions

The research framework for the SOQ narrative development was designed to guide long-term decisions that would provide orderly development of multiple methodologies and explicit descriptions of them. This programmatic design was based on (a) concepts of grounded theory and anticipated use of constant comparison as an analysis technique (Glaser & Strauss, 1967; Strauss & Corbin, 1990; 1994); and (b) basic assumptive modes for research design described earlier by Goetz & LeCompte (1984).

Prior to formulating the programmatic design, we examined the context in which the SOQ was operating at the time to articulate practical needs of administration, dissemination, and marketing. These included such contingencies as nature of the current population; data entry, analysis, and retrieval; turn-around time; and feedback procedures.

Based on these discussions, we developed a long-term design to guide programmatic development of the narrative section. The design contained an integrated, multi-purpose framework whose flexible structure would allow for recursive analysis between and/or within sites at three functional levels. These levels were arbitrarily identified as Level I, II, and III to designate closure of recursive analysis based on function and need.

Each level had a discrete function within the larger research framework to provide a range of practical and theoretical uses. Regardless of Level designation and commensurate with the SOQ's theoretical perspective (Ekvall, 1987; Lauer, 1994), the individual was at all times considered the basic unit of analysis. Thus, individuals' data and the psychological perception of each participant was the common thread or anchor that grounded all other applications. Movement forward that clustered comments into themes was always traceable back to individual comments.

Research Framework: Level I

The Level I research framework was designed to accommodate both practical needs of how to provide useful feedback to the participants and theoretical ones of what to include and why. The purpose of the narratives at Level I was to articulate the participants' authentic "voices" with verbatim responses and to organize data into clusters that accurately reflected their authenticity (Miles & Huberman, 1994; Huberman & Miles, 2002). This approach included the potential for communication to groups or organizations as appropriate and allowed for an extension of meaning and use of narrative aspects of the data to enrich and inform the numerical results.

The focus of Level I was on the individual as the basic unit of analysis. As such, its data could provide building blocks for other levels of analysis and use (see also Level I Analysis section in this chapter). It was designed primarily to provide descriptive feedback to participants and to establish an open-coded, generative baseline for later examination and recursive analysis, if needed.

Research Framework: Level II

The Level II research framework was designed to focus more specifically on the climate dimensions. It was parallel to the theoretical framework of Level I, but could be used as a stand-alone to focus more directly on the dimensions. The Level II framework served a dual purpose of providing research data about the instrument and its constructs and practical data about perceptions and behaviors of the participants in regard to the dimensions. SOQ dimension headlines were used as the entry coding typology, and the accompanying definitions and descriptors provided standardization of meaning and selection. To avoid the 'squeeze' of early data reduction with a pre-determined typology and to ensure that all responses were given equal attention, additional categories were created as necessary. Focusing on differences as well as similarities helped to maintain the generative function of the data (Goetz & LeCompte, 1984; Miles and Huberman, 1994). These categories were identified and reported along with the dimension headlines.

Level II was designed with the need for multiple as well as single site functions in mind. It encompassed what Miles & Huberman (1994) described as single case studies or case sites within one organization (Dutcher, 1997) or multiple ones across sites from different organizations or different departments (Sobieck, 1996). The primary purpose of the single analyses was for external reports and feedback to clients in organizations who might be interested in elaborated data that focused specifically on the dimensions.

Research Framework: Level III

The Level III framework was designed primarily for research and development. Its purpose was to examine SOQ constructs with an alternative set of assumptions and methods than we used to validate the numerical data. It focused on grounded theory development and/or validation (Glaser & Strauss, 1967; Strauss & Corbin, 1990; 1994).

We continued to balance data reduction with a generative emphasis by intentionally examining for differences, as well as similarities, and by seeking emergent patterns and themes that might lead to unique perspectives on the broader domain of climate theory.

Initial Level III analysis on the SOQ began with the results of categories and constant comparison from Level II outputs, allowing for a recursive return to verbatims if necessary. We did not rule out the possibility of returning to Level I, if any prior or emergent memos, questions, or intrigues indicated a direction worth pursuing.

Programmatic Analysis Considerations

In considering further development of qualitative data, SOQ researchers should keep the initial programmatic design in mind and examine not only the content and process of the studies, but the total research framework. In the programmatic design, additional uses of the Level I process appropriately involve studies whose

purpose focuses more toward the inductive, subjective, generative, and constructive assumptions described by Goetz & LeCompte (1984) as basic modes in research design. In these situations, open coding and a descriptive focus are most appropriate. Outcomes are more associated with uniqueness of context or case than to a particular theory or pre-determined mind set. Using the Level II or III process involves decisions about pre-determined codes that depend on the purpose of a particular inquiry. They are thus somewhat more deductive, objective, though not necessarily enumerative. For example, when the focus was on SOQ dimensions, that typology provided entry coding and focus. Similarly, Level II or III can provide a process framework for any study whose theoretical framework or guiding constructs have been identified. In all cases the determining methodological choice is based on purpose of design and the need of inquiry. In other words, what do you want to know and why do you need to know it?

Using Our Research Framework to Drive Analysis of Narrative Data

In 1991 we developed and implemented a protocol to standardize analysis of the narrative data. We developed a case example and conducted four 12-hour training programs from 1991 to 1993. Thirty-six people were trained to analyze the narrative data. Analysis procedures were based on the iterative design described in section IV. The primary focus of this initial work was on Level I (open-coded approach) and Level II (dimension codes). The Level III or theory building phase of the research design began in 1995, when there was sufficient analysis at Level I and II to enable cross-site examination (Sobieck, 1996).

Analysis Design and Implementation

One of the many challenges of working with words as the basic unit of communication is dealing with the amount of data and varying levels of abstraction and elaboration that exist in narrative responses (Miles & Huberman, 1994; Murdock, 1994).

Making decisions about how and when to include or exclude information and determining organizational schemas that help make the data more manageable without eliminating its meaning and context is a central concern in qualitative research traditions (Lincoln & Guba, 1985).

Having laid the groundwork to maintain and use differences as well as similarities in the initial research design, we implemented this approach with specific analysis procedures that were both philosophically amenable to multi-method approaches and practically applicable to the reporting needs of consumers.

We used a basic "within and between" question structure as a starting point and considered each question as a subset of data that represented the individual perceptions of each participant in a particular setting. Participant narratives were entered verbatim by question in random order with consecutive numbers for possible retrieval and resorting.

We began by examining each question separately in order of participant number for key words and phrases that would provide a picture of the similarities and differences on things that helped, hindered, and described actions that could be taken. Cross-question examination of single individual's verbatims was used only if we needed clarification or had questions about meaning or context of an individual's full entry.

Next, we constructed categories under each question that summarized the commonality in verbatims. All verbatims, regardless of their similarities or differences to each other, were sorted and reported under themes or patterns for each question. With this level of explicitness we could re-examine, discuss, debate, or re-sort categories if necessary during the analysis to provide inter-subjective verification for either a team or other individual analysts.

During analysis, the frequency of similar responses was not considered any more important than a single different response; all were included. In reporting results, however, we did present the results in order of confluence. (See interpretation

section later in this section for elaboration of presentation and debriefing concerns and questions regarding this decision.)

The "within and between" question procedures were maintained during both Level I and II analyses, and each iteration and summary built deliberately on the previous ones. Results from Level I and II analyses can be used as stand-alone data or in combination with some other focus or framework as illustrated by Level III work for formal or middle range theory building (Denzin, 1978; Strauss, 1987; Goetz & LeCompte, 1984; Strauss & Corbin, 1994).

Using this explicit analysis protocol provided a standardized way of organizing the data and made the information accessible for additional or different analyses later as in Grivas' (1996) study using adapter/innovator concepts within a climate dimension sort. In addition, the data could be triangulated across questions to help present a richer picture of perceptions of the climate or to target intervention areas for action.

Level I Analysis: Unique Considerations and Characteristics

Because the function of Level I analysis was to describe and elaborate on participants' perceptions of their climate, it represents the closest relationship between the data and participants' varied perspectives. There were no preconceived notions of what the data should or could look like. Thus, we used descriptive coding and constructed the categories according to the responses (Miles & Huberman, 1994).

Level II Analysis: Unique Considerations and Characteristics

Level II analysis was somewhat more deductive and focused on responses in regard to the climate dimensions themselves. Level II analysis provided data that related directly to Part I of the instrument and thus contained elaboration and description in that direction. Although we initially reduced the data by imposing this pre-set code (see case example in Appendix for coding description and examples), we continued

to work directly from participant verbatims. There was a stronger theoretical focus on identifying similarities, but, as in Level I, we deliberately identified differences and held them in a category called "other" for later clarification and generative development.

Level III Analysis: Unique Considerations and Characteristics

Because the function of Level III analysis was formal theory development and multi-method instrument validation, we examined all the administration sites from which we had narrative results and purposefully selected (Kuzel, 1992; Miles & Huberman, 1994; Patton, 1990) sites from one organization over time on which Level II analysis had been completed (Sobieck, 1996). Within this selection we focused on data from Version III of the CIQ and Version IV of Part I of the SOQ.

Final Level III work on this set is in progress. It will contain the "within and between" question structure extended to "within and between" sites, beginning with category summaries and themes from the Level II dimension analysis and continuing with similar procedures to determine commonalties and differences between and among them.

Qualitative Studies

As a result of adding the narrative section, new research possibilities have emerged, as well as improved feedback for application. Two studies have been completed thus far that demonstrate added value from taking a multi-method approach. Each is summarized below.

Cross-site Analysis

We know that climate, as an intervening variable, is influenced by many factors within the organization and in turn affects organizational and psychological processes. The three narrative questions yield qualitative data that can help us

confirm the extent to which the current nine dimensions are playing out within the specific organizational context.

In addition, we can address the question: What else affects organizational climate beyond those nine dimensions? Finally we can inquire about what factors will have the greatest impact toward sustaining change and improving efficiencies and productivity within the organization.

We knew from earlier studies and our own extensive quantitative analysis, the climate dimensions of the SOQ have been found to account for a great deal of the variance of an organization's climate. Could these narrative responses help us understand even more about an organizational climate?

The answer to this question is yes. How do we know? From a research study conducted by Sobieck (1996) and our parallel investigation and research into the critical factors that have the greatest impact on organizational effectiveness which culminated in the development of the Model for Organizational Change (see Section 1 Chapter 2 of this manual).

Sobieck's (1996) examination of cross-site narrative response used the CIQ IIIA and SOQ IV for data collection. Level II analysis was performed by analyzing narratives from six data sets selected from the research and development departments of an international Fortune 500 corporation. The study focused on how the narratives written by the participant related to the applied and theoretical purpose of assessing organizational climate.

The first major insight provided from this research was that across all six sites, there was a great deal of narrative data that provided more detail and depth regarding all nine dimensions of the SOQ. As a result of coding all the narrative data from across all six sites, Sobieck was able to discover which comments, and how many, related to the nine dimensions of the SOQ. The fact that roughly half the comments related to the dimensions supplements the quantitative results from Part A of the SOQ and provides specific narrative data to illustrate and expand on how the participants perceive the climate through the lens of the nine dimensions.

Sobieck (1996) also found that roughly half the narrative comments went beyond the nine dimensions of the SOQ. The study also focused on analyzing the "un-coded" responses (those comments that did not relate to the dimensions). Her process for analysis was to classify each of the narrative responses into general topics, review the narratives to assess for appropriateness of topic, create a headline that best described the theme, cluster, or pattern of responses and then summarize the findings.

The factors that emerged beyond the nine dimensions included:

- Corporate Structure
- Resources
- Vision
- Respect
- Cultural Diversity
- Government regulations
- Communications
- Rewards and recognition
- Management
- Mentoring
- Strategic planning
- Organizational Structure
- Policies and Procedures
- Goal setting
- Motivation
- Bureaucracy
- Physical environment

All these factors emerged in addition to the comments that were coded within the nine dimensions. Any of these factors can influence the climate and the effects of climate. Sobieck (1996) had no access to the Model for Organizational Change (MOC) when conducting her research. It is interesting to note that all these factors identified above fit neatly within the structure of this model.

This is good conceptual validation of the MOC, but more importantly, this study demonstrated that the addition of the narrative questions adds additional practical value. This study illustrates that the narratives do, in fact, provide detail and deeper description into the nine dimensions of climate. It also demonstrates that the narratives provide broader understanding of the context. So, we obtain a better understanding of the quantitative results and we can contextualize the results and better understand what's working, what's not, and what we should do about it (beyond the nine dimensions).

Style and Climate

Later in this manual (see Section 3 Chapter 5) we will report the relationships between the SOQ and both cognitive style (KAI) and problem-solving style (VIEW). Generally, we do not find many significant quantitative relationships between individual psychological climate and these style measures. At least from a correlational perspective, these two constructs of style and climate appear to be distinct. However, given the systems approach to creativity and innovation, we would expect that there should be some interaction between people and place. This was the purpose of the second major qualitative study.

Grivas (1996) investigated the relationship between cognitive style and the perceptions of creative climate. His study built on the earlier work from Isaksen and Kaufmann (1990) and Clapp and Kirton (1994), and provided the basis for the publication of Isaksen and Lauer (1999). He studied a sample of 147 participants from an international research and development organization within a global consumer products company who were involved in a leadership development program in which CPSB played a role.

After conducting correlational and discriminant function analysis very few significant differences were found between Kirton's (1994) adaptors and innovators when it came to the nine dimensions of individual psychological climate. For example, previous studies had found that innovators saw more conflict in their environments

and adaptors saw more challenge. Grivas did not find similar results. He did discover some significant correlations between Kirton's sufficiency of originality subscale and the dimensions of Trust/Openness and Conflict. There were no significant differences when more extreme styles were subjected to discriminant function analysis.

By analyzing the qualitative data provided by these participants, he did find some important differences in the way they perceived their climate. These included:

Adaptors required some kind of validation from management in order to express themselves, and perceived Freedom and Risk-Taking to be present within their climate. They were less likely to take risks if they perceive that Risk-Taking was not actively encouraged in the climate, or there was no formal means of taking risks within organizational systems. Adaptors see Risk-Taking as a means of support for creativity, but if they perceive Risk-Taking is not acceptable within their climate, their creativity will be hindered.

- Adaptors need to have Freedom built into their climate as a part of the existing system. If they perceive rules as inflexible, they will not push against them.
- Innovators do not need to perceive approval for Risk-Taking or Freedom in order to feel it as present within their climates. These are innately possessed. What will hinder an innovator are more likely the things that stand in the way of their Freedom and Risk-Taking. Inflexible rules and structures will then appear as obstacles to their creativity. To an Innovator, inflexible rules and structures are irritating nuisances preventing them from proceeding in ways in which they would prefer.
- Innovators do not want to be bogged down by the idea of conforming to the group, whereas adaptors view a cohesive, well-structured, group as a strength. Adaptors feel they may use their creativity most effectively when they are a part of a cohesive team. Innovators see their own personal commitment, as well as the personal commitment from others as beneficial.

- They view this commitment as a resource from which they can draw to further their own success.
- Without clear direction from management, adaptors experience a sense of disengagement, as if they were experiencing some anxiety because they felt separated from the larger group. Innovators became frustrated with the lack of direction from management, as if they believed they already had a clear idea of where they were going and were wondering why others weren't just following along.

Findings from analyzing the narratives found strong relationships between the responses on the climate measure, particularly from the rule-group conformity sub-scale of the KAI. This study provided clear evidence of the value of obtaining additional insights derived from taking a multi-method approach. Much more detail was made available to better understand the impact of the nine dimensions from Part A, but additional insights providing subtle yet deeper understanding of style differences was also found. Further, by adding the factor of individual style, even more value can be obtained through climate assessment.

Vision and Leadership Behavior

Another study examined the results from the SOQ narrative section and a survey about the new organizational vision of 347 management, support and field personnel within a global energy corporation (Dutcher, 1997). These qualitative data were analyzed by both the dimensions of the SOQ and the leadership practices outlined by Kouzes and Posner (1987). CPSB had access to both the climate and vision survey results, so this study sought to better understand the relationships among the climate dimensions, the new organizational vision, and the leadership practices.

Once again, a great deal of the narrative data from the vision survey and the narrative questions from the SOQ were coded on the nine dimensions. In addition, there were some themes that emerged that did not fall within the conceptual space

of the dimensions. Further, there was a strong relationship between the narratives provided by the SOQ and the leadership practices outlined by Kouzes and Posner (1987). Most of the participants provided comments that could be understood through the lens of the dimensions of climate, and at the same time, these could be interpreted through the leadership practices.

This study confirmed the findings of Sobieck (1996) and Grivas (1996). The SOQ narrative data provided a deeper understanding of how each of the nine dimensions of climate was being perceived within the organizational context. Dutcher (1997) also found strong relationships between the organizational vision and leadership behavior as antecedent factors influencing the climate.

Research and development will continue on the SOQ from both a quantitative and qualitative perspective. We will expect that, as a result of increased use of the measure, there will also be improved understanding of the key constructs under examination. Schmied (1993) noted that qualitative research is often the initial state for quantitative work. This may be because the categories for classification must be identified before quantitative research can be conducted and the validity and reliability statistics can be deployed. Of course, within any measure the items rest in the semantic construction of the question and are provided through qualitative analysis. We believe that taking a multi-method approach will help us improve the measure, as well as its practical applications.

A current research project utilized the narrative data from the SOQ to examine the validity of the Model of Organizational Creativity (Guerts, 2009; Isaksen, 2013).

CHAPTER 2
THE TRANSLATION OF THE CCQ

Creative Climate Questionnaire IA (CCQ IA)

The original work of Ekvall to develop a measure of climate is well documented. Given our interest in an ecological approach to creativity research, we were impressed with the concepts of measure of creative climate promoted by Ekvall. As a result, we endeavored to translate his Swedish version of the CCQ into English. This chapter documents these efforts.

On a visit to the International Center for Studies in Creativity at Buffalo State College (CSC-BSC) in 1986, Ekvall along with Isaksen and staff members at CSC-BSC translated the CCQ from Swedish to English. The CCQ IA included 50 items designed to assess ten dimensions of creative climate put forth by Ekvall. Each dimension was composed of five items. Traditional translation protocol was followed, meaning that each item was translated from Swedish into English, and then from English to Swedish (back-translation), and then checked with Ekvall and others to ensure that the original meaning for each item was preserved.

CCQ IA Design

The CCQ IA was a 50 question pen-and-paper self-report instrument. It required subjects to respond to each item using a Likert type scale from 0 to 3. Each item ranged from "not at all applicable" to "applicable to a high degree" (there was no neutral point).

The items on the CCQ IA pertained to one of ten creative climate dimensions. Each dimension on the measure contained five questions that were totaled and divided by five to provide a mean score. If one of the five items was missing, dimensional scores were still tabulated; the four items were totaled and divided by four. However, if any dimension had less than four items, they were identified as incomplete and

hence, were not calculated. Instrument scores were calculated both as feedback for the individual and aggregated for group, department, and/or organizational scores.

In the format used in this study, the 50 questions were randomly arranged within the CCQ IA. The instrument was hand scored and was designed by Ekvall to be easily scored by the respondent.

CCQ IA Procedures

A sample size of 466 subjects for CCQ IA was included in this data analysis. Data were gathered from subjects of organizations that contracted with Isaksen for training programs in Creative Problem Solving (CPS). Instructions for the completion of the instruments, demographic questions, and a code of ethics were mailed to the organizations for distribution to the individuals involved in the programs.

Participation was voluntary and respondents were assured that their answers would be held confidential. Subjects were informed that data were gathered for research purposes and to assist their organization in its change efforts. Moreover, they were informed that the purpose of the CCQ IA is to develop a better understanding of their personal perceptions of the environment in which they work and to assess their readiness for change. Course participants were asked to return the instrument to Isaksen in sealed envelopes. The time span of data collection used in this study ranged from October 1987 to November 1988.

Subjects for CCQ IA

The subjects were individuals (N=466) from organizations that contracted with Isaksen for training programs in Creative Problem Solving (CPS). The majority of these subjects (n=434) completed the English CCQ IA as part of their training in these programs. These subjects consisted of 237 women (54.6%) and 196 men (45.2%). The age of the subjects in this study ranged from 21 to 66 years. The mean age of the subjects was 40.6 years. The educational level of the sample, although not completed by 204 subjects, ranged from completed high school (n=10) to

doctorate (n=17). A majority of the subjects had either a bachelor's degree (n=78) or a master's degree (n=77). The remaining subjects stated they had some college (n=40) or some graduate (n=8) education.

The subjects in this study were employed by six different organizations located in the North Eastern and Central United States of America. Of these organizations, two were classified as education (n=248) and the remaining four were categorized as profit-oriented businesses (n=186).

The subjects classified as education consisted of 177 women (71.7%) and 70 men (28.3%), of which all but two subjects identified themselves as teachers. Both these educational organizations were located in suburban areas. The North Eastern US Elementary School (n=44) was part of a large and relatively affluent school district. The student enrollment in the elementary school at the time of this study was greater than 800 pupils. The North Eastern US School District (n=204) consisted of five separate schools within the district. The district had a total student enrollment in excess of 5,000 pupils. Three of the schools were elementary, one was a junior high school, and one was a senior high school.

The subjects categorized as business consisted of 60 women (32.3%) and 126 men (67.7%). This business sample comprised four different organizations. These organizations were a Household Products Manufacturer, an Interior Products Manufacturer, a group of S & L Bank Managers, and an Electronic Publishing Company. The organizational level of the business subjects ranged from hourly employee (n=40) to low top management (n=12), with a majority identified as middle management (n=92).

The Household Products Manufacturer (n=63) was a large international company located in the Central US. At the time of this study it had over 110,000 employees. This company was formed in the late 1830's. Its products include foods, laundry soaps, cleaning detergents, personal and health care products. The employees who were included in this study identified their function in the organization as marketing (n=14), product development (n=28), quality control (n=1), R & D (n=3), secretarial (n=15), systems analysis (n=1), and other (n=1).

The Interior Products Manufacturer (n=74) was located in the North Eastern US, and sells its products internationally. At the time of this study this company had over 25,000 employees. This company was formed in the 1860's. The products manufactured by this company include interior furnishings such as floor coverings, building products and furniture; and specialty products for building, automotive, and textile industries. The employees who were included in this study identified their function in the organization as managers (n=2), engineering (n=12), data processing (n=2), manufacturing (n=8), marketing (n=17), purchasing (n=4), product development (n=6), quality control (n=1), R & D (n=19), sales (n=1), and other (n=2).

The group identified as Savings and Loan Bank Managers (n=25) were branch managers at a chartered federal saving and loan bank. The bank's headquarters were in the North Eastern US, and it had branches in New York, Michigan, Florida, Texas, and California. At the time of this study, this bank had 3,795 employees. The bank began operations in the 1850's. The primary focus of this bank was on mortgages, consumer and auto loans. In 1990 the bank was seized and placed into receivership by US federal banking officials. Later that year it was sold to another bank.

The group identified as the Electronic Publishing Company (n=24) was a subsidiary of a larger corporation that purchased the company in the late 1960's. The subsidiary is located in the Central US. Information on the number of employees that worked for the electronic publishing company was unavailable, but the parent company employed more than 21,000 people at the time of this study. The primary business of the electronic publishing company was the development and maintenance of computerized databases of reference and research materials. The two major databases it developed at the time of this study were focused on legal and business information. The major business of the parent company was the production and distribution of paper-based office and school supplies. The employees of the electronic publishing company who were included in this study identified their function in the organization as marketing (n=3), product development (n=19), and quality control (n=2).

Table 1
Group Make-Up: Subjects and Frequency Percentages for CCQIA

Organization	Subjects (n)	Frequency %
Educational Samples		
N. E. U.S. Elementary School	44	10.1
N. E. U.S. School District	204	47.0
Education Group Total	*248*	*57.1*
Business Samples		
Household Products Manufacturer	63	14.5
Interior Products Manufacturer	74	17.1
S & L Bank Managers	25	5.8
Electronic Publishing Company	24	5.5
Business Group Total	*186*	*42.9*
Overall Total	**434**	**100.0**

The age of subjects from the educational organizations ranged from 21 to 66 years with a mean age of 39.9 years. The business subjects had an age range of 23 to 64 years with a mean age of 41.3 years. A table of the organizations involved in this study (see Table 1) shows the percentages of subjects from each organization, as well as their division into type of organization.

Due to incomplete responses on the CCQIA, some subjects were excluded from the analysis. The number excluded depended on the form of statistical analysis used, and whether it used the 50 items of the CCQIA, or the aggregation of these items into one of the CCQIA's 10 dimensions. This aggregation allowed a maximum of one item to be missing in the computation of a CCQIA dimension. Statistical procedures that required item scores, (i.e., reliability, item correlations and principal component factor analysis), contain fewer subjects than those procedures that are dimensionally dependent (i.e., normative information and dimension correlations). Thus, fluctuations in subject counts do occur in the analyses presented in the quantitative results reported.

Analysis of the CCQ IA

The subjects' data was analyzed in two formats. First, all subjects' responses to the CCQIA were combined. This aggregation of scores is referred to as the 'overall' group (n=434). Second, the subjects were split into two groups, either business or education. One group was composed of the four for-profit organizations that were represented as the business group (n=186). The other group included the two public educational organizations that were represented in this study as the education group (n=248). The means and standard deviations for the overall sample and for the business and education groups on the CCQIA's 50 questions are provided in Table 2.

The rationale for dividing the subjects into groups was based on a number of factors. First, given the potentially different cultures associated with these two contexts, business and education, it was important to initially examine climate data independently. This procedure would allow potential differences to emerge between these two contexts. Thus, these potential differences could be identified by the CCQ IA scores of the two groups thereby lending support to the belief that the CCQ IA can distinguish between the climates of different organizations.

Table 2
CCQIA Item Norms: Means and Standard Deviations

	Education Group			Business Group			Overall		
CCQ1A Item	Mean	Std. Dev.	n	Mean	Std. Dev.	n	Mean	Std. Dev.	n
1	2.55	.65	248	2.58	.57	186	2.56	.61	434
2	1.71	.71	248	1.72	.74	186	1.72	.72	434
3	1.82	.81	248	1.95	.76	185	1.88	.79	433
4	1.56	.88	248	1.69	.89	186	1.62	.88	434
5	1.58	.83	248	1.42	.83	186	1.51	.83	434
6	2.64	.59	246	2.66	.65	185	2.65	.61	431
7	0.76	.81	246	1.10	.89	186	0.91	.86	432
8	2.16	.78	246	1.79	.78	185	2.00	.80	431
9	1.38	.87	247	1.17	.91	186	1.29	.89	433
10	1.31	.79	248	1.11	.81	186	1.22	.81	434
11	2.22	.70	248	2.16	.61	186	2.20	.66	434
12	1.83	.77	248	1.77	.74	186	1.81	.76	434
13	2.23	.73	248	1.89	.85	186	2.09	.80	434
14	1.78	.90	248	2.01	.75	186	1.88	.84	434
15	1.32	.85	248	1.24	.81	185	1.29	.84	433
16	2.22	.78	248	1.94	.82	185	2.10	.81	433
17	2.20	.74	248	1.96	.69	185	2.10	.73	433
18	1.81	.79	248	1.81	.72	185	1.81	.76	433
19	0.27	.54	248	0.44	.65	186	0.34	.60	434
20	1.35	.70	248	1.19	.82	186	1.28	.76	434
21	2.27	.71	248	2.10	.67	186	2.19	.70	434
22	1.89	.70	247	1.94	.76	186	1.91	.73	433
23	1.54	.70	248	1.54	.75	185	1.54	.72	433
24	1.74	.78	248	1.84	.69	185	1.78	.74	433
25	1.88	.73	248	1.78	.76	185	1.84	.74	433
26	2.03	.77	248	2.03	.73	185	2.03	.75	433
27	1.88	.80	248	1.86	.81	185	1.87	.80	433
28	1.68	.77	248	1.85	.70	185	1.75	.75	433
29	2.08	.81	248	2.02	.74	185	2.05	.78	433
30	0.85	.91	248	1.00	.93	185	0.91	.92	433
31	1.18	.75	248	1.10	.80	185	1.15	.77	433
32	2.69	.51	248	2.68	.52	185	2.68	.51	433
33	2.04	.73	248	2.14	.71	185	2.08	.73	433
34	2.00	.72	248	2.03	.85	185	2.01	.78	433
35	1.54	.77	247	1.56	.81	185	1.55	.79	433
36	1.65	.88	246	2.08	.85	185	1.83	.89	432
37	1.99	.83	246	2.19	.75	185	2.08	.80	431

38	2.07	.80	246	1.82	.79	185	1.96	.80	431
39	2.14	.74	246	1.92	.75	184	2.05	.75	431
40	0.56	.68	247	0.72	.84	185	0.63	.76	430
41	2.36	.68	248	2.15	.66	185	2.27	.68	432
42	0.92	.83	248	0.93	.83	185	0.93	.83	433
43	1.75	.80	248	1.74	.85	185	1.74	.82	433
44	1.77	.73	248	1.97	.74	185	1.86	.74	433
45	1.82	.75	248	1.92	.75	185	1.87	.75	433
46	2.23	.69	248	1.85	.74	185	2.07	.73	433
47	2.44	.63	248	2.17	.63	185	2.32	.65	433
48	1.63	.71	248	1.46	.69	185	1.56	.71	433
49	0.63	.70	247	0.79	.82	185	0.70	.76	432
50	1.58	.72	248	1.50	.71	185	1.55	.71	433

This belief is supported by the means and standard deviations of the CCQ IA's ten dimensions that are presented on Table 3. This table shows substantial differences in the business and education means scores occurred on the CCQ IA dimensions of Challenge, Idea-Support, Playfulness/Humor, Debate, Conflict, and Risk-Taking. However, one must be careful in drawing this inference due to the fact that the gender makeup of the education group is predominately female, while the business group has a larger male percentage. These differences were not statistically tested for levels of significance.

Table 3

CCQIA Scale Norms: Means and Standard Deviations

	Educ. Group			Bus. Group			Overall		
CCQIA Dimension	**Mean**	**Std Dev.**	**n**	**Mean**	**Std Dev.**	**n**	**Mean**	**Std Dev.**	**n**
Challenge	2.42	.50	248	2.33	.43	185	2.38	.48	433
Freedom	1.92	.50	248	1.88	.56	185	1.91	.52	433
Idea-Support	1.76	.66	248	1.92	.58	185	1.83	.63	433
Dynamism	2.19	.56	248	2.10	.53	185	2.15	.55	433
Playfulness	2.02	.55	248	1.83	.56	185	1.94	.56	433
Debate	1.97	.53	248	1.80	.51	185	1.90	.53	433
Trust	1.65	.60	248	1.69	.58	185	1.67	.59	433
Conflict	0.62	.54	247	0.81	.63	185	0.70	.59	432
Risk-Taking	1.53	.52	248	1.42	.58	185	1.49	.55	433
Idea-Time	1.43	.60	248	1.46	.59	185	1.44	.60	433

A second rationale for the division of subjects into these two groupings was that it allowed us to explore the instruments internal structure across contexts while maintaining a sufficient sample size for statistical purposes. In this respect, if similar Cronbach's Alphas and factor structures were found across the groups, it would support the internal consistency of the CCQ IA.

In practice, the CCQ IA was applied to determine how the climate can be improved to support higher levels of creativity and innovation in departments of the organization. However, the power requirements of the data analysis techniques utilized in this study made analysis of the individual departments, as well as the organizations, impossible.

To best fulfill both the theoretical and statistical requirements involved in this study it was held that the division of subjects into the major employment sectors of business and education would be the best available solution. Thus, the analysis performed in this study meets statistical power requirements and came as close as possible to fulfilling the theoretical design of the CCQ IA, since it divides the subjects into two distinct employment sectors that should have distinctly different climates. The distinction in climate between education and business environments tends to be supported by the dimensional means of the groups presented in Table 3.

The quantitative analysis of the CCQ IA undertaken in this study was strictly exploratory. The broad hypothesis tested was that the items of the CCQ IA align with the dimension of climate they were intended to measure and they do so in a reliable manner. In this respect, no formal hypotheses were conceived prior to the analysis in regard to the statistical relationships that may or may not occur between the CCQ IA's items or dimensions.

In other words, this study did not confine the examination of the factor structure to any theoretical assumptions.

Further, this study did not attempt to examine if these items were valid indicators of theoretical constructs defined by the CCQ IA's dimensions. Instead, this study examined the coherency of the instrument's factor structure and the internal reliability of the dimensions it is intended to measure.

To begin the analysis, Pearson-Product Moment correlations (i.e., Pearson r) were carried out. The areas addressed through the use of this procedure focused on: 1) determining what relationships exist among the 50 items of the CCQ IA; and 2) examining the extent to which the relationships among CCQ IA dimensions coincide with the relationships of climate dimensions described by the theorists.

Since the Pearson correlation indicates the strength of association between variables (Hair, Anderson, Tatham, & Black, 1992) this procedure was appropriate for exploring the above questions. Thus, as used in this study the Pearson correlation examined the nature of the relationships between the items, as well as the dimensions of the CCQ IA. In using the Pearson correlation the basic assumptions upon which it is founded were met because: 1) Scatter plots of the variables suggested normal distributions; and 2) the sample size was over 100 subjects which overrides concern for normality assumptions. In addition, reviews of these scatter plots, which are not included in this report, indicated that it was not necessary to make adjustments for outliers.

In this study, both list-wise and pair-wise methods of excluding data were used to calculate correlational matrices. The correlational matrix to be presented for item responses of the entire group of subjects in this study used the list-wise deletion method. The rationale for using this method was that this correlational matrix provided the foundation for the subsequent Principal Component Factor Analysis that expects a correlation matrix that has a constant number of subjects. Correlational matrixes for the education and business subgroup item responses were also performed in the same manner. However, these results are not put forward since they were roughly similar to those of the entire group.

The Pearson correlations used for the CCQ IA dimensions were based on the use of pair wise deletion as a means to preserve cases. This type of deletion method was deemed appropriate because the percentage of missing cases is far below the 10% recommended and those that do occur are randomly distributed between the cases and variables of this study. Since hypotheses regarding the direction of relationships were not predicted, all correlations presented in this study are 2-tailed. In this study,

the significance of relationship is reported at a $p < .05$ or $p < .01$ level. The coefficient of determination ($r2$) has not been computed in this study since the importance of these correlational relationships were not the target of this aspect of the study.

This study used the quantitative method developed by Harman (1967) known as Principal Component Factor Analysis (PCFA). The purpose of using this multivariate technique was to explore the internal structure of the CCQ IA and the interrelationships that occur among the instruments' items. This provides means to address the question of whether the CCQ IA assessed ten dimensions as designed by Ekvall.

The PCFA was deemed to be an appropriate statistical technique to explore the ability of the CCQ IA to assess ten dimensions of creative climate because when it is used from an exploratory perspective it assists in searching for the structure among a set of variables (Hair et al., 1992). To determine this structure the PCFA first examines the relationship of the set of variables or items in a questionnaire based upon their inter-item correlations.

On the basis of these relationships the PCFA then uses a variation of the general factor model known as principal component analysis to reduce the number of items into factor scores. The PCFA used in this study then extracted factors using an orthogonal solution. To increase the interpretability of these factors the Varimax (Kaiser, 1958) method of factor rotation was used.

Since the PCFA was employed as an exploratory technique, the number of dimensions derived from the analysis were not defined in the process described. Instead, the PCFA determined the number of dimensions based on an Eigen value of 1.0 or greater, as proposed by Kaiser (1958). The results presented will be restricted to those rotated loadings that are greater than or equal to .30 for easier interpretation of the results.

The final statistical technique employed in this study was the Cronbach's Alpha. This statistical technique performs an item analysis on the components of a scale and

computes a coefficient of reliability. The Cronbach's Alpha was utilized in this study to address the question of the internal reliability of the CCQ IA's dimensions. In this study, the adequacy of a dimension was deemed to be acceptable if the Cronbach's Alpha was greater than or equal to .70. This value was deemed acceptable because: 1) the CCQ IA is still a research edition open to future revisions; 2) the nature of this study is exploratory; and 3) the commonly used threshold value of acceptable reliability for psychological instruments is .70 (Hair et al., 1992).

Correlational Analysis of CCQ IA

The item correlations of the CCQ IA's 50 questions for the entire sample of subjects in this study who fully completed the questionnaire were presented. Of these correlations, 95% (1189 of 1250) are significant at a level of at least $p > .05$. This suggests that the concepts measured by these items are similar.

Similarity is desired since the 50 items are designed to measure the narrow concept of creative climate and dimensions of the concept that had been reported in theory. Thus, these high levels of correlation may suggest that the items assess a similar domain. However, if this similarity is deemed to be too strong it could be inferred that: 1) the 50 items measure only one or two concepts; and that 2) the ten dimensions made up from these questions are not distinct since there are such high levels of inter-correlations in their underlying items.

In order to partially test these inferences related to the strength of the items' relationships, the correlations were broken down into the items that were designated to make up a dimension. If these breakdowns show that the correlations among dimension items are stronger than those with other dimension items it would suggest that the inferences are invalid. The results of this test are presented in Table 4 through Table 13.

Table 4
Inter-Correlations among CCQ IA Challenge/Motivation Items for Overall Sample (n = 419)

Challenge/Mot. Items	1	11	21	32	41
1	1.00				
11	.42	1.00			
21	.40	.59	1.00		
32	.43	.36	.42	1.00	
41	.41	.46	.53	.54	1.00

Note: All correlation coefficients are significant at p > .01 (2-tailed).

The results shown on Table 4 show the inter-correlations of the items designed to measure the CCQ IA dimension of Challenge/Motivation. The table shows that these relationships are statistically adequate. When we compared these to their correlations with other items of the CCQ IA, it was found that their strongest relationship is to each other, except for item 21 that does have some higher correlation coefficients with items that are designed to measure other dimensions of creative climate.

Table 5
Inter-Correlations among CCQ IA Freedom Items for Overall Sample (n = 419)

Freedom Items	2	13	22	33	43
2	1.00				
13	.32	1.00			
22	.34	.32	1.00		
33	.36	.34	.48	1.00	
43	.41	.31	.22	.35	1.00

Note: All correlation coefficients are significant at p > .01 (2-tailed).

The results shown on Table 5 show the inter-correlations of the items designed to measure the CCQ IA dimension of Freedom. The table shows that these relationships are statistically adequate, but lower than those obtained for the dimension of Challenge/Motivation. When Lauer (1994) compared these to their correlations with other items of the CCQ IA it was found that their strongest relationship tends to be to each other rather than items that are designed to measure other dimensions of creative climate. However, items 33 and 43 do have correlations to other items of the CCQ IA that are greater.

Table 6
Inter-Correlations among CCQ IA Idea-Support Items
For Overall Sample (n=419)

Idea-Support Items	3	14	24	28	44
3	1.00				
14	.51	1.00			
24	.56	.63	1.00		
28	.52	.61	.70	1.00	
44	.42	.53	.65	.62	1.00

Note: All correlation coefficients are significant at p > .01 (2-tailed).

The results shown on Table 6 show the inter-correlations of the items designed to measure the CCQ IA dimension of Idea-Support. The table shows that these relationships are statistically adequate, and tend to be higher than those obtained for the dimension of Challenge/Motivation. When we compared these to their correlations with other items of the CCQ IA it was found that their strongest relationship is to each other rather than items that are designed to measure other dimensions of creative climate.

Table 7
Inter-Correlations among CCQ IA Dynamism/Liveliness Items for Overall Sample (n = 419)

Dynamism/Live Items	6	16	27	37	46
6	1.00				
16	.37	1.00			
27	.35	.64	1.00		
37	.37	.46	.60	1.00	
46	.22	.34	.32	.32	1.00

Note: All correlation coefficients are significant at p > .01 (2-tailed).

The results shown on Table 7 show the inter-correlations of the items designed to measure the CCQ IA dimension of Dynamism/Liveliness. The table shows that these relationships are statistically adequate, but the correlation coefficients do have a larger variation than those of the dimensions presented thus far. When Lauer (1994) compared these to their correlations with other items of the CCQ IA it was found that their strongest relationship tends to be to each other rather than items that are designed to measure other dimensions of creative climate. However, item 46 did have correlations to other items of the CCQ IA that were greater.

Table 8
Inter-Correlations among CCQ IA Playfulness/Humor Items for Overall Sample (n = 419)

Playful/Humor Items	9	17	34	38	47
9	1.00				
17	.31	1.00			
34	.34	.26	1.00		
38	.52	.38	.40	1.00	
47	.39	.47	.39	.60	1.00

Note: All correlation coefficients are significant at p > .01 (2-tailed).

The results shown on Table 8 show the inter-correlations of the items designed to measure the CCQ IA dimension of Playfulness/Humor. The table shows that these relationships are statistically adequate, but like those of Dynamism/Liveliness the correlation coefficients tend to vary. When we compared these to their correlations with other items of the CCQ IA it was found that their strongest relationship tended to be to each other, rather than items that were designed to measure other dimensions of creative climate. However, item 17 did have correlations to other items of the CCQ IA that were stronger.

Table 9
Inter-Correlations among CCQ IA Debate Items for Overall Sample (n = 419)

Debate Items	8	18	29	39	48
8	1.00				
18	.33	1.00			
29	.30	.36	1.00		
39	.28	.19	.53	1.00	
48	.36	.27	.43	.42	1.00

Note: All correlation coefficients are significant at p > .01 (2-tailed).

The results shown on Table 9 show the inter-correlations of the items designed to measure the CCQ IA dimension of Debate. The table shows that these relationships are statistically adequate, and are similar to those presented for the CCQ IA Freedom dimension (Table 5). When we compared these to their correlations with other items of the CCQ IA it was found that their strongest relationship tended to be to each other, rather than items that were designed to measure other dimensions of creative climate. However, item 18 did have correlations to other items of the CCQ IA that were greater.

Table 10
Inter-Correlations among CCQ IA Trust/Openness Items for Overall Sample (n = 419)

Trust/Openness Items	4	15	26	35	45
4	1.00				
15	.47	1.00			
26	.42	.42	1.00		
35	.27	.30	.43	1.00	
45	.36	.43	.56	.60	1.00

Note: All correlation coefficients are significant at p > .01 (2-tailed).

The results shown on Table 10 show the inter-correlations of the items designed to measure the CCQ IA dimension of Trust/Openness. The table shows that these relationships are statistically adequate. When we compared these to their correlations with other items of the CCQ IA it was found that their strongest relationship tended to be with each other. However, item 35 did have some correlations that were higher with items that are designed to measure other dimensions of creative climate.

Table 11
Inter-Correlations among CCQ IA Conflict Items for Overall Sample (n = 419)

Conflict Items	7	19	30	40	49
7	1.00				
19	.45	1.00			
30	.46	.36	1.00		
40	.40	.47	.43	1.00	
49	.47	.46	.53	.68	1.00

Note: All correlation coefficients are significant at p > .01 (2-tailed).

The results shown on Table 11 show the inter-correlations of the items designed to measure the CCQ IA dimension of Conflict. The table shows that these relationships are statistically adequate, and tend to be similar to those obtained for the dimension of Challenge/Motivation. When we compared these to their correlations with other items of the CCQ IA it was found that their strongest relationship was to each other, rather than items that were designed to measure other dimensions of creative climate.

Table 12
Inter-Correlations among CCQ IA Risk-Taking Items for Overall Sample (n = 419)

Risk-Taking Items	10	20	23	25	50
10	1.00				
20	.38	1.00			
23	.36	.61	1.00		
25	.35	.32	.44	1.00	
50	.41	.37	.49	.42	1.00

Note: All correlation coefficients are significant at p > .01 (2-tailed).

The results shown on Table 12 show the inter-correlations of the items designed to measure the CCQ IA dimension of Risk-Taking. The table shows that these relationships are statistically adequate. When we compared these to their correlations with other items of the CCQ IA it was found that their strongest relationship tended to be with each other. However, item 50 did have some correlations that were higher with items that are designed to measure other dimensions of creative climate.

Table 13
Inter-Correlations among CCQ IA Idea-Time Items for Overall Sample (n = 419)

Idea-Time Items	5	12	31	36	42
5	1.00				
12	.48	1.00			
31	.45	.39	1.00		
36	.37	.46	.36	1.00	
42	.36	.36	.53	.35	1.00

Note: All correlation coefficients are significant at p > .01 (2-tailed).

The results shown on Table 13 show the inter-correlations of the items designed to measure the CCQIA dimension of Idea-Time. The table shows that these relationships are statistically adequate. When we compared these to their correlations with other items of the CCQIA it was found that their strongest relationship tended to be with each other. However, item 36 did have some correlations that were higher with items that are designed to measure other dimensions of creative climate.

Our comparison of the results shown on Table 4 through Table 13 with the item correlations showed that in most instances the strongest correlations occur among the scale items. The correlations were also significant at a level of at least p > .01.

These results tend to downplay the inferences related to the strength of the CCQ IA items correlation coefficients. Thus, it supports the assertion that although significant relationships occur among a majority of the CCQ IA's items, these occur because the items are designed to measure the narrow concept of creative climate since the greatest levels of significance tend to occur between items designed to measure a specific dimension of creative climate. In cases where this does not occur it suggests that the wording of the item needed to be adjusted (e. g., items 17,

18, 21, 33, 35, 36, 43, 46, 50). The need to adjust the wording of items was tested in the other analyses performed in this study.

The strengths of these relationships are further indicated in the correlations of the CCQ IA's scales presented on Table 14. The results suggest that this high level of relationship exists across employment contexts and does so in a consistent manner.

Table 14
Inter-Correlations among CCQIA Scales for Overall Sample
CCQ IA Dimension (n = 433)

CCQIA Dimension (n = 433)	2	3	4	5	6	7	8	9	10
Challenge	.62	.53	.67	.44	.48	.57	-.36	.54	.44
Freedom		.61	.58	.51	.54	.56	-.31	.66	.54
Idea-Support			.60	.45	.58	.60	-.35	.75	.67
Dynamism				.59	.68	.54	-.25	.67	.50
Playfulness					.56	.49	-.28	.54	.41
Debates						.42	-.17	.66	.58
Trust							-.54	.57	.50
Conflict								-.26	-.25
Risk-Taking									.64
Idea-Time									

Notes: 1. All correlations were statistically significant at p > .01 (2-tailed).
2. For all correlations involving the dimension of Conflict (8) N = 432.

Factor Analysis of the CCQIA

The results of the factor analysis of the CCQ IA are included in Table 15. The 10 dimensions having an Eigen value greater than one, account for 62.1% of the variance. The first factor includes items from six of the 10 theoretical dimensions. In short, the factor structure does show some of the theoretical dimensions holding together, but lacks overall or satisfactory coherence.

Table 15
Results of Principal Component Analysis of CCQ IA Items: (N = 419)

Item	Theoretic Scale	Component 1	2	3	4	5	6	7	8	9	10
24	Idea-Support	.792									
28	Idea-Support	.762									
14	Idea-Support	.719									
44	Idea-Support	.681									
36	Idea-Time	.672									
3	Idea-Support	.601									
50	Risk-Taking	.568				.367					
23	Risk-Taking	.541								.363	.312
35	Trust	.510									
20	Risk-Taking	.491								.479	
12	Idea-Time	.441				.412	.354				
37	Dynamism	.435	.329						.354		
18	Debate	.421					.345				
25	Risk-Taking	.419	.375		.339						
32	Challenge		.795								
41	Challenge		.705								
1	Challenge		.568								
33	Freedom	.439	.535								
49	Conflict			-.800							
40	Conflict			-.771							
19	Conflict			-.714							
7	Conflict			-.686							
30	Conflict			-.653							
26	Trust	.356	.406	.408					.306		
38	Playfulness				.715			.377			
9	Playfulness				.709						
34	Playfulness				.644						
47	Playfulness				.597			.346			
31	Idea-Time					.712					
42	Idea-Time					.701					
5	Idea-Time					.651					
43	Freedom	.340				.435					.355
16	Dynamism				.314		.606				
17	Humor						.538				
27	Dynamism	.410					.507				
21	Challenge						.468				
11	Challenge						.447				
6	Dynamism						.394				
39	Debate							.717			
29	Debate	.358						.715			
48	Debate				.321			.524		.373	
46	Dynamism		.327					.512		.403	
15	Trust								.654		
4	Trust								.638		
45	Trust	.437		.335					.462		
8	Debate									.477	
10	Risk-Taking	.339								.445	

2	Freedom										.684
13	Freedom										.664
22	Freedom		.361							.316	.448
% Variance Accounted for by Factors		31.5	6.5	4.8	4.1	3.1	2.8	2.7	2.4	2.2	2.0
Eigenvalues		15.7	3.2	2.4	2.1	1.5	1.4	1.4	1.2	1.1	1.0

Internal Consistency of CCQ IA

The results of computing the Cronbach's Alpha for the educational, business and overall sample are reported in Table 16.

Table 16
Alpha Coefficients for CCQ IA Scales

	Educ. Group		Bus. Group		Overall	
CCQIA Dimension	Cronbach □	n	Cronbach □	n	Cronbach □	n
Challenge	.83	248	.75	185	.80	433
Freedom	.70	247	.75	185	.72	432
Idea-Support	.88	248	.86	184	.87	432
Dynamism	.81	244	.74	183	.77	427
Playfulness	.77	245	.76	184	.77	429
Debate	.72	244	.73	182	.73	426
Trust	.80	247	.78	184	.79	431
Conflict	.79	246	.81	185	.81	431
Risk-Taking	.76	248	.81	185	.78	433
Idea-Time	.79	246	.78	185	.78	431

All the coefficients are above the generally accepted standard of .70, but given the results from factor analysis, further work needed to be done to assure that the items measured the concepts defined by each of the dimensions of the CCQ.

Creative Climate Questionnaire IIA (CCQ IIA)

The data presented here is drawn from Cabra's (1996) study. The initial translation of the CCQ IA from Swedish to English included 50 items on ten dimensions. This revision to the CCQ IA occurred in 1989, and it entailed some editing to items, changing the order of items and adding an omnibus item. The completion of this revision yielded a 51-item instrument that was designed to measure ten dimensions of creative climate, as well as an overall sense of the degree to which the measure related to support for creativity (the omnibus item).

The revision was done in part through the use of statistical analysis of the CCQ IA. The techniques used included item and dimension distributions, item and dimension correlations, and assessment of the internal reliability and factor analysis. Previous results suggested modifications could improve the instrument. The items of the CCQ IA were re-examined by two individuals who were fluent in both English and Swedish to determine if the translation was valid. As with any translation, the outside translators had some differences in opinion with the initial translation. Their examination identified some discrepancies and these were taken into account for the revision.

Further examination by Isaksen and his staff identified some areas of concern with the language of the items. For example items that contained double concepts (e.g., There is a good deal of tension here due to prestige conflicts) were modified due to concerns that items would foster confusion among the respondents. Thus, respondents' scores varied depending on the concept they had selected to evaluate. Items that contained double negatives were also modified (e.g., There is no fear of being stabbed in the back). Other items were made more simple and direct. To reduce response bias some question items were counter balanced. Finally, some adjectives were removed from items for fear that they would create confusion.

CCQ IIA Design

The CCQ IIA was a 51 question pen-and-paper self-report instrument. It required subjects to respond to each item using a Likert type scale from 0 to 3. Each item ranged from "not at all applicable" to "applicable to a high degree" (there was no neutral point).

The items on the CCQ IIA pertained to one of ten theoretical creative climate dimensions. Each dimension on the measure contained five questions that were totaled and divided by five to provide a mean. If one of the five question items was missing, dimensional scores were still tabulated; the four items were totaled and divided by four. However, if any dimension had less than four items, then they were determined as incomplete and hence, were not calculated. Instrument scores were calculated both as feedback for the individual and aggregated as group, department, and/or organizational score.

CCQ IIA Procedures

A sample size of 1844 subjects for CCQ IIA was included in this data analysis. Data were gathered from subjects of organizations that contracted with Isaksen for training programs in Creative Problem Solving (CPS). Instructions for completing the instruments, demographic questions, and a code of ethics were mailed to the organizations for distribution to the individuals who would be involved in the programs.

Participation was voluntary and respondents were assured that their answers would be held confidential. Subjects were informed that data were gathered for research purposes and to assist their organization in its change efforts. Moreover, they were informed that the purpose of the CCQ is to develop a better understanding of their personal perceptions of the environment in which they work and to assess their readiness for change. Course participants were asked to return the instrument to Isaksen in sealed envelopes.

The data was collected from August 1989 to November 1991. The subjects were comprised of 769 (41.7%) men and 635 (34.4%) women. There were 440 (23.9%) subjects that did not state their gender. The age of the subjects ranged from 17 to 64 years. The mean age of the subjects was 35.30 years. The educational level of the subjects were as follows: (a) High School (n=21), (b) Some College (n=134), (c) Bachelors Degree (n=250), (d) Some Graduate (n=22), (e) Masters Degree (n=177), and Doctorate (n=159).There were subjects that did not report their educational levels (n=1081).

From the sample size, 756 subjects were from an international oil company; 503 subjects were from institutional conferences held by an international consumer and industrial products manufacturer; 162 subjects were from a Special Administration Educational Conference at a State University College at Buffalo retreat; 92 subjects were part of a Doctoral Dissertation focused on Nursing; 46 subjects were from an international chemical company; and 65 subjects were undergraduate students enrolled in a creative studies course. Table 17 shows the areas of function for the CCQ IIA sample.

Table 17
Group Make-Up: Subjects and Frequency Percentages for CCQ IIA

Organization	Subjects (n)	Frequency %
Educational Samples		
Creative Studies Classes	65	3.5
Special Administration Educational Conferences	162	8.8
Education Group Total	*227*	*12.3*
Business Samples		
International Household Product Manufacturer Conference	503	27.3
Oil Company	756	41.0
Chemical Company	46	2.5
Business Group Total	*1305*	*70.8*
Other Samples		
Two-day Creative Problem Solving programs	30	1.6
Instructional Research Project	157	8.5
Dissertation Research	92	5.0
Missing	33	1.8
Other Sample Total	*312*	*16.9*
Overall Total	**1844**	**100%**

The educational level of the sample, was not completed by 58.6% of the subjects (n=1081). It ranged from completed high school (n=21) to doctorate (n=159). Most of the subjects had either a bachelor's degree (n=250) or a master's degree (n=177). Other subjects stated they had some college (n=134). The remaining subjects (n=22) confirmed their educational status as some graduate. The means and standard deviations for the overall sample are provided in Table 18 (for CCQ IIA items) and Table 19 (for CCQ IIA scales).

The organizational levels, ranged from hourly employees (n=78) to top executives such as President, Chief Executive Officer, and Operating Officer (n=5). The majority of the subjects identified their organizational levels as Middle (n=235), which consists of titles such as Office Managers, Professional Staff, Mid-Level Managers, and First Level (n=232) which consisted of Fore Person, Crew Chiefs, Section Supervisors, Faculty, and Staff. The remaining subjects identified themselves as Executives (n=25) which consisted of Vice Presidents, Directors, Board Level Professionals, and Upper Middle (n=25) which consisted of Department Executives, Plant Superintendents, Plant Managers, Senior Professional Staff, Deans, Associated Brand Managers, Assistant Directors, Brand Managers and Section Head. Some subjects were deleted from the data analysis due to incomplete responses.The number to be excluded was contingent upon the type of statistical analysis utilized and whether the analysis used the 51 question items of the CCQ IIA, or the accumulation of these question items into one of the CCQ IIA's 10 dimensions.

Table 18
CCQ IIA Item Norms: Means and Standard Deviations

CCQIIA Item	Mean	Std. Dev.	n
1	2.16	.78	1831
2	1.71	.80	1831
3	1.69	.81	1831
4	2.40	.82	1831
5	1.16	.84	1831
6	1.79	.77	1831
7	1.45	.84	1831
8	1.88	.91	1831
9	1.42	.82	1831
10	1.31	.81	1831
11	2.17	.78	1831
12	2.11	.78	1831
13	2.05	.89	1831
14	1.68	.90	1831
15	1.45	.81	1831
16	1.83	.82	1831
17	1.19	.91	1831
18	1.90	.99	1831
19	1.63	.83	1831
20	1.61	.87	1831
21	1.99	.88	1831
22	2.10	.83	1831
23	2.19	.81	1831
24	1.48	.91	1831
25	1.54	.92	1831
26	1.72	.77	1831
27	2.23	.77	1831
28	1.62	1.02	1831
29	1.33	.81	1831
30	1.01	.76	1831
31	2.23	.84	1831
32	2.01	.82	1831
33	2.18	.85	1831
34	1.49	.89	1831
35	1.79	.86	1831
36	1.75	.82	1831
37	1.58	.87	1831
38	1.67	.83	1831
39	1.58	.77	1831
40	1.44	.85	1831
41	1.93	.86	1831
42	1.62	.86	1831
43	1.56	.82	1831

44	2.21	.87	1831
45	2.37	.78	1831
46	2.28	.77	1831
47	1.66	.80	1831
48	1.93	.81	1831
49	1.85	.77	1831
50	1.55	.86	1831
51	1.62	.90	1831

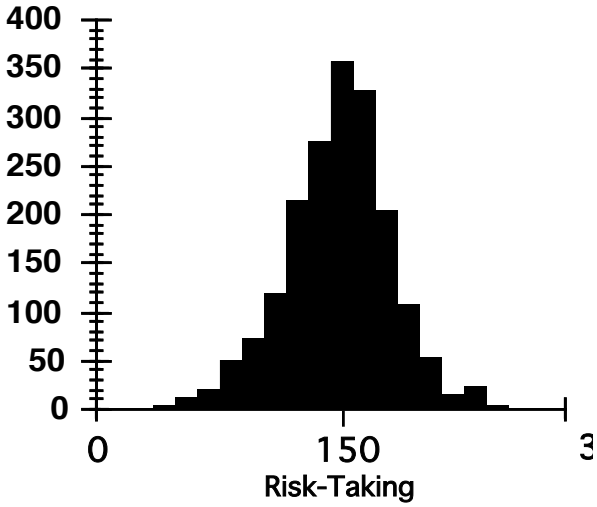
Table 19
CCQ IIA Scale Norms: Means and Standard Deviations

CCQ IIA Dimension	Mean	Std. Dev.	n
Challenge	209.11	63.04	1844
Freedom	191.02	55.10	1844
Idea-Support	193.08	65.40	1844
Dynamism	184.89	63.57	1844
Playfulness/Humor	166.00	61.47	1844
Debate	187.71	60.59	1844
Trust/Openness	162.66	57.40	1844
Conflict	180.46	63.41	1844
Risk-Taking	156.68	47.10	1844
Idea-Time	138.69	62.90	1844

Distribution of Scores

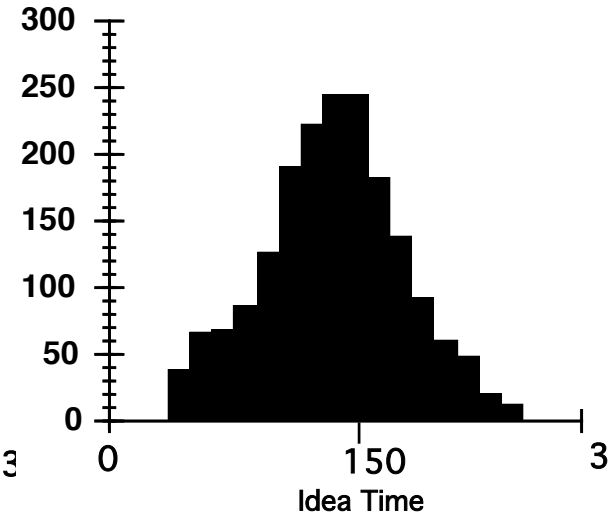
The distributions of the CIQ IIA dimensions are presented in Tables 20 to 29. The Risk-Taking dimension (Table 20) showed a leptokurtic curve. This curve indicated that the majority of the respondents selected the middle items (1 or 2) on the Likert scale of the CCQ IIA. The theoretical mean or mid point of the CCQ is 150. Although the Likert scale on the CCQ IIA ranged from 0 to 3, the average scores are presented as numbers between 0 and 300. We found it to be easier to present the results in the hundreds as opposed to decimals. Although visually the distribution reflected a leptokurtic curve, the mean (156.68), median (160.00), and mode (160.00) scores were acceptable. The standard deviation for the Risk-Taking dimension was 47.1

Table 20



Mean 156.68 Median 160.0
Mode 160.00 Std. dev. 47.1(

Table 21

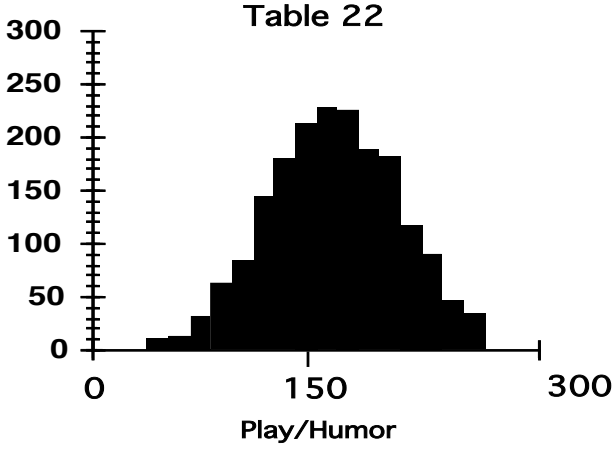


Mean 138.68 Median 140.00
Mode 140.00 Std. dev. 62.90

The Idea-Time dimension (Table 21) showed a fairly normal distribution (unimodal) of the scale. This was the type of curve one would want to obtain. As a result one can stipulate that respondents selected a normal share of scores from the Likert scale of the CCQ IIA. The scale frequencies yielded a mean of 138.68, a median score of 140.00 and a mode score of 140.00. The standard deviation for the Idea-Time dimension was 62.9.

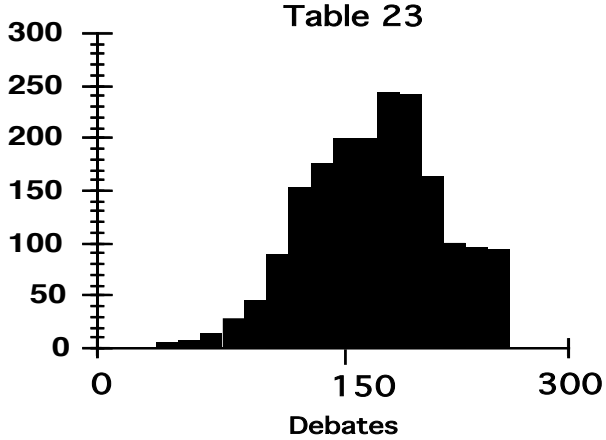
The Playfulness/Humor dimension (Table 22) yielded a fairly normal distribution with a mean score of 165.99, median 160.00, and a mode score of 160.00. However, the Debate dimension (Table 23) yielded a negatively skewed curve. Its central tendency scores yielded a mean of 187.71, a mode of 200.00, and a median score of 200.00. The standard deviation for the Playfulness/Humor dimension was 61.47. These scores reflected a tendency for the respondents to select higher scores on the CCQ IIA for the Debate dimension. A negatively skewed distribution on the debate dimension could indicate that the measure producing the scores had a ceiling. This effect may be attributed to the percentage of marketing personnel in the sample.

Table 22



Mean 165.99 Median 160.00
Mode 160.00 Std. dev. 61.47

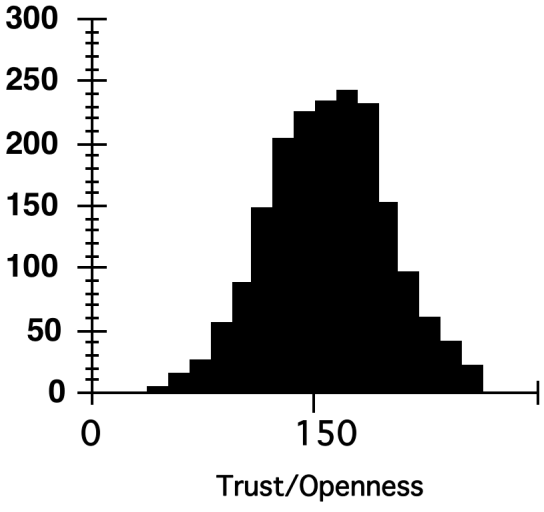
Table 23



Mean 187.71 Median 200.00
Mode 200.00 Std. dev. 60.58

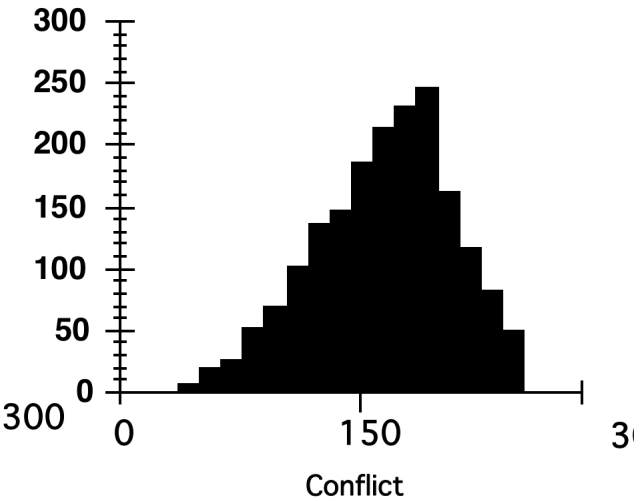
The Trust/Openness dimension (Table 24) yielded a fairly normal distribution with a mean score of 162.65, median 160.00, and a mode score of 180.00. The standard deviation for the Trust-Openness dimension was 57.4. In this table there were many "average" scores with a few high and low scores on each side.

Table 24



Mean 162.65 Median 160.00
Mode 180.00 Std. dev. 57.40

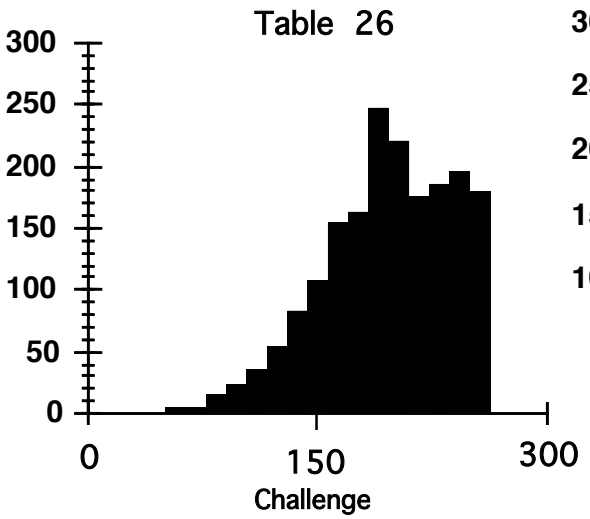
Table 25

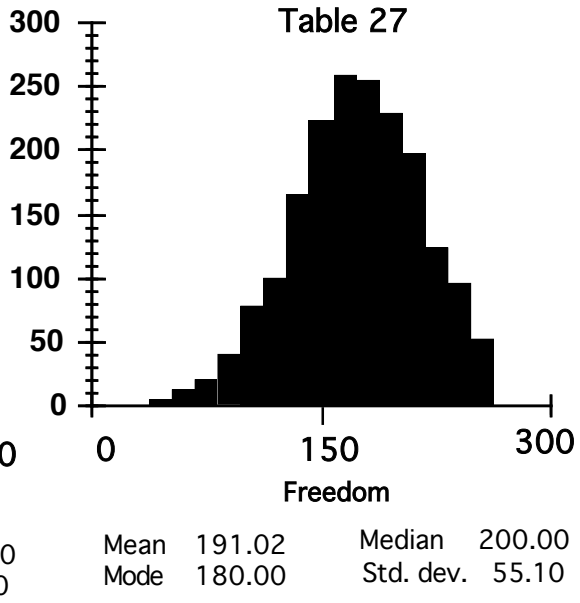


Mean 180.45 Median 180.00
Mode 220.00 Std. dev. 63.40

The Conflict dimension (Table 25) yielded a negatively skewed curve. Its central tendency scores yielded a mean of 180.45, a mode of 220.00, and a median score of 180.00. The standard deviation for the Conflict dimension was 63.4.

The Challenge/Motivation dimension, as seen in Table 26, yielded a negatively skewed curve. Its central tendency scores yielded a mean of 209.10, a mode of 200.00, and a median score of 220.00. The standard deviation for the Challenge/Motivation dimension was 63.4. These scores reflected a tendency for the respondents to select higher scores on the CCQ IIA for the Challenge dimension. These scores were considered the highest when compared to any other frequency scores of the CCQ IIA dimensions.

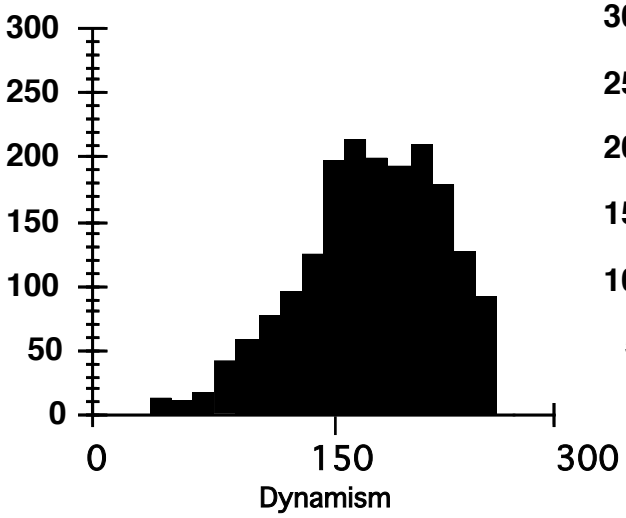




The Freedom dimension (Table 27) yielded a fairly normal distribution with a slight negative skew. The central tendency results yielded a mean score of 191.02, a median of 200.00, and a mode score of 180.00. The standard deviation for the Freedom dimension was 55.1. It appears that respondents were selecting a normal share of scores from the Likert scales of the CCQ IIA.

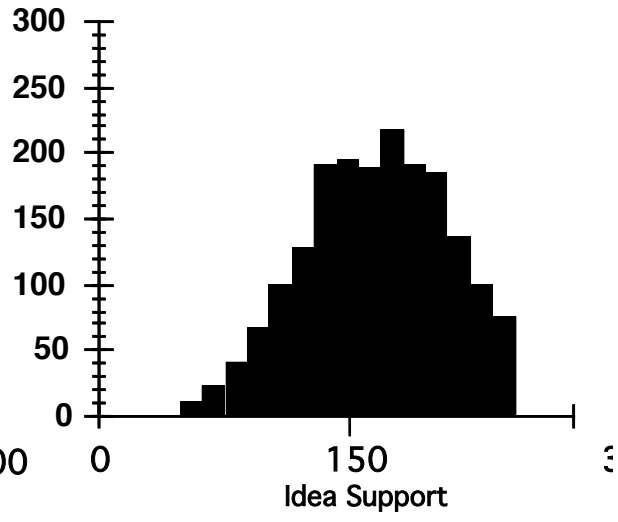
The Dynamism (Table 28) dimension yielded a negatively skewed distribution. Its central tendency scores resulted in a mean of 193.08, a median of 200.00, and a mode score of 180.00. The standard deviation for the Dynamism dimension was 65.39. The Idea-Support dimension (Table 29) yielded in fairly normal distribution with a slight negative skew. Its central tendency scores resulted in a mean of 184.89, a median of 180.00, and a mode score of 200.00. The standard deviation for the Idea-Support dimension was 63.56.

Table 28



Mean 193.08 Median 200.00
Mode 180.00 Std. dev. 65.39

Table 29



Mean 184.89 Median 180.00
Mode 200.00 Std. dev. 63.56

The distribution of scores was important and useful to further development of the climate measure. Not only do they help solve a variety of problems in inferential statistics, they help reveal scales or dimensions that may be deemed overly-skewed. These results provided the foundation to investigate further the specific items, within their respective scales, that influence the overly-skewed results. Hence, an item could be eliminated or modified so as to improve the internal consistency of the measure.

Correlational Analysis of the CCQIIA

Table 30 shows the correlations among the dimensions of the CCQ IIA for the entire sample (n=1844). Except for the conflict dimension, the level of significance for each correlation is very strong at p< .01. The results showed that the dimensions have a positive relationship to each other. The correlational coefficients ranged from .33 to .68.

Table 30
Inter-Correlations Between Dimensions of the CCQ IIA (n = 1844)

Dimension	1	2	3	4	5	6	7	8	9	10
Challenge	1.00									
Freedom	.64	1.00								
Idea-Support	.62	.64	1.00							
Dynamism	.67	.63	.65	1.00						
Play/Humor	.41	.53	.58	.63	1.00					
Debate	.43	.51	.57	.57	.57	1.00				
Trust/Openness	.59	.61	.68	.62	.60	.56	1.00			
Conflict	.48	.48	.63	.46	.47	.33	.68	1.00		
Risk-Taking	.44	.58	.58	.56	.51	.47	.55	.45	1.00	
Idea-Time	.36	.46	.54	.41	.45	.44	.45	.38	.47	1.00

Notes: 1. All correlations significant at the p < .01
2. Coefficients for Conflict dimension were inverted.

The inter-item correlations of the CCQ IIA's 51 questions for the entire sample (n=1844) are not presented here but may be found in Cabra (1996). Cabra reported that of these correlations 99.7% (1827 of 1831) were significant at a level p< .05. This indicated that the factors measured by these question items are similar. While this similarity is desired in an instrument that measures a relatively narrow concept, it also poses a concern that if the similarity is considered too strong (co-linearity) this makes it challenging, if not impossible, to distinguish how the dimensions have their separate effects on climate.

Factor Analysis of the CCQ IIA

Table 31 shows the results of a Principal Component (varimax rotation) analysis which yielded seven factors, accounting for approximately 54.6% of the variance. The first factor (Challenge) accounted for 31.9% of the total variance; the second factor (Freedom) accounted for 5.9%; the third factor (Idea-Support) 4.7%; the fourth factor (Dynamism) 3.7%; the fifth factor (Playfulness/Humor) 3.5%; sixth factor (Debate) 2.6%; and the seventh factor (Trust/Openness) 2.3%.

The only four-item factor that corresponded cleanly to its theoretic dimension was Debate. Idea-Time also appeared to load properly. However, a number of items loaded on other theoretical dimensions outside its "own" respective dimension. These items were 23, 19, 42, 43, 37, and item 29. These items suggest a need for revision to better fit the dimension they were intended to measure. This is because, as reflected in the factor analysis, these items had high loading scores on a factor that represents a different CCQ IIA dimension. For example, item 23 (Idea-Support) had scores that fell on factors one, four, and six. These three scores had loadings > .30 which, as a rule of thumb, are considered significant (Hair, Anderson, & Tatham, 1987). Loadings higher than .50 are considered very significant (Hair, et al., 1987). Another example is item 42. It loaded on three other factors at scores higher than .30.

The result of these factor analyses also highlighted the similarity of the CCQIIA's items, as well as its dimensions, since in many instances the items moved from one loading to another depending on the sample being presented. This high interrelationship may also suggest that the use of factor analysis may not be the appropriate statistical technique to determine the theoretical structure of the CCQ. In fact, the results from the Maximum Likelihood Analysis were not included due to its inability to fully rotate all items. The correlations of the items assessed were so high, that the factor analysis technique may not be able to determine how the question items relate and determine what structure underlies them.

The results of the factor analyses presented suggested that the 50 items of the CCQIIA assess eight factors of a larger construct. Although the analysis reflected seven factors, the remaining factor (Conflict) was found within the fifth factor as a result of its inverse scoring. The results of the factor analysis also tended to suggest that the instrument be revised. This conclusion was reached as a result of the quantity of overlapping items found among several dimensions in the factor analysis. Items 23, 19, 42, 43, 37, 2, and 29 loaded in three factors above the .30 acceptable score. Item 43 loaded in four factors. Items 46, 33, 45, 4, 27, 21, 31, 49, 32, 22, 34, 3, 14, 15, 24, 25, 20, 48, 38, 18, 47, 7, 36, 16, and 9 loaded in two factors also above .30.

Table 31
Principal Component Analysis of CCQ IIA Items (Varimax Rotation): Entire Sample (n = 1831)

Item	Theoretic Scale	1	2	3	4	5	6	7
46	Debate	.613					.508	
33	Idea-Support	.599				.317		
45	Playfulness/Humor	.593		.350				
44	Liveliness/Dynamism	.583						
4	Liveliness/Dynamism	.581	.343					
23	Idea-Support	.568			.311	.344		
13	Idea-Support	.564						
27	Trust/Openness	.561				.359		
21	Challenge	.559	.389					
31	Challenge	.531	.493					
49	Risk-Taking	.516			.306			
32	Freedom	.515	.423					
22	Freedom	.509	.345					
19	Risk-Taking	.445			.321			.364
11	Challenge		.717					
41	Challenge		.707					
1	Challenge		.656					
12	Freedom		.541					
39	Risk-Taking		.487					
34	Liveliness/Dynamism		.487	.444				
3	Idea-Support		.420			.319		
5	Playfulness/Humor			.750				
35	Playfulness/Humor			.688				
14	Liveliness/Dynamism		.361	.655				
15	Playfulness/Humor		.302	.631				
24	Liveliness/Dynamism		.447	.538				
25	Playfulness/Humor			.521		.378		
42	Freedom			.427	.381			.346
30	Idea-Time				.729			
10	Idea-Time				.717			
50	Idea-Time				.714			
20	Idea-Time	.332			.692			
40	Idea-Time				.603			
43	Idea-Support		.383	.332	.394	.320		
28	Conflict					.672		
8	Conflict					.571		
48	Conflict	.389				.566		
17	Trust/Openness					.550		
38	Conflict	.371				.530		
18	Conflict		.384			.478		
47	Trust/Openness		.363			.457		
37	Trust/Openness		.388	.332		.420		
7	Trust/Openness					.337	.314	
26	Debate						.762	
6	Debate						.734	

36	**Debate**			.315			.669	
16	**Debate**		.322				.546	
9	**Risk-Taking**		-.331					.640
2	**Freedom**		.366	.301				.385
29	**Risk-Taking**		.313				.301	.345
	% Variance Accounted for by Factors	31.9	5.9	4.7	3.7	3.5	2.6	2.3
	Eigenvalues	15.9	2.9	2.3	1.8	1.7	1.3	1.1

Internal Reliability of the CCQIIA

The statistical procedures of Cronbach's Alpha, Guttman split-half and Spearman Brown were used to determine the internal reliability of the CCQ IIA. The statistical procedure Cronbach's Alpha is used to determine the internal reliability of the CCQIIA dimensions. Alpha coefficients range from 0 to 1.0 and identify how much the items in an instrument are measuring the same thing (Vogt, 1993). The Guttman split-half statistical procedure investigates the reliability of a measure by looking at how well the scores on one half of the items correlate with the other half (Vogt, 1993). Finally, the Spearman Brown procedure predicts the approximate gain in reliability of a measure if one were to increase the number of observations (Vogt, 1993).

The results of the three statistical analyses as presented in Table 32 were nearly all greater than or equal to .70. The exceptions were: Risk-Taking with a Cronbach's Alpha of .52, Guttman split-half of .54, and a Spearman Brown score of .54; Freedom which contained an Alpha score of .69; and Conflict which contained a split-half score of .68. In general, the dimensions were reliable except for Risk-Taking.

Table 32
CCQIIA Reliability

Theoretic Scale	Cronbach's Alpha	Guttman split-half	Spearman Brown
Challenge	.81	.80	.82
Freedom	.69	.72	.74
Dynamism	.77	.75	.78
Trust	.71	.71	.71
Idea-Time	.81	.80	.82
Playfulness/Humor	.78	.71	.75
Conflicts	.72	.68	.72
Idea-Support	.83	.84	.86
Debate	.82	.80	.82
Risk-Taking	.52	.54	.54

Content Validity of the CCQ IA and IIA

Content validity is concerned with the degree to which a measure represents knowledge or behaviors from the domain it purports to measure. According to Jaeger (1990) content validity is not determined through statistical procedures, but is assessed through careful and informed judgment. It was important to determine the extent to which the dimensions measured by the CCQ were representative of behaviors associated with the domain commonly referred to as "creative climate."

A literature-based study was carried out by Lauer (1994) to accomplish this purpose. Lauer's study examined the degree to which the ten climate dimensions identified and measured by Ekvall were supported by other scholars. Lauer sought to establish whether there was sufficient evidence in the creativity literature to support the use of Ekvall's dimensions as a means of understanding creative climates in a variety of contexts.

The contexts examined included education, family, and business organizations. Lauer's study focused on 50 works by 38 authors. Each work was selected for its clear relationship to the study of creativity and innovation. A majority of the works reviewed also focused on the creative environment in which creativity and innovation occur.

Lauer initiated his study by identifying 100 books and journal articles that had some connection to the concept of creative environment. The works selected undertook both theoretical and empirical approaches to examine the nature and nurture of creativity and innovation. The initial list of works was obtained and reviewed. This process was used to identify the 50 most pertinent works. Three criteria were used to narrow the resources: 1) their focus on environmental factors related to creativity; 2) the recognized stature of the author in the field; and 3) the work mentioning more than one concept of climate.

After culling the list of works, Lauer then examined these works for the explicit climatic factors related to creativity. All references to the climate dimension proposed by Ekvall were highlighted in these works. The results of Lauer's study (see Table 33) showed that the 10 climate dimensions proposed by Ekvall were widely supported in the literature. The frequency with which Ekvall's dimensions were described by other authors ranged from 12 to 41, with an average frequency across the dimensions of 21.43. Thus, in general the literature supports the dimensions adopted by Ekvall and used in our initial translations of the CCQ. The full references within the table can be found in Lauer (1994).

Table 33
Sources of Support for Ekvall's Dimensions of Creative Climate

		DIMENSION														
AUTHOR(S)	DATE	CH	MO	FR	IS	DY	LI	PL	HU	DE	TR	OP	CO	RT	IT	OT
Abbey, A. & Dickson, J. W.	1983		X	X	X									X		X
Abetti, P. A.	1986	X	X	X										X		X
Amabile, T.M.	1983b	X	X	X	X	X	X	X						X	X	X
Amabile, T.M.	1988	X	X	X	X	X	X	X		X				X	X	X
Amabile, T.M. & Associates	1990	X	X	X				X						X		X
Amabile, T.M. & Gryskiewicz, N.	1989	X	X	X	X	X	X			X	X	X	X	X	X	X
Arieti, S.	1976		X	X	X	X	X	X	X	X	X	X	X		X	X
Christie, J.F.	1980							X	X							
Christie, T.	1970		X	X						X			X			X
Crutchfield, R.S.	1962	X	X	X	X	X	X				X	X	X	X		X
Csikszentmihalyi, M.	1990		X	X												X
Dansky, J.L. & Silverman, I.W.	1975							X								
Dentler, R.A. & Mackler, B.	1964															X
Dimock, M.	1986		X	X							X		X	X		X
Feitelson, D. & Ross, G.S.	1973							X								
Feldhusen, J.F. & Hobson, S.K.	1972			X				X	X			X		X		X
Gibb, J.R.	1972	X	X	X				X			X	X	X	X		X
Glover, J.A.	1977													X		
Goyal, R.P.	1973			X	X							X				X
Gruber, H.E.	1989a	X	X	X		X		X					X	X	X	X
Guilford, J.P.	1950	X	X	X												X
Guilford, J.P.	1975	X	X	X					X			X		X		X
Hall, J.	1980	X		X	X	X		X	X		X	X	X	X	X	X
Harrington, D.M.	1990	X	X	X	X	X	X	X		X	X	X		X	X	X
Hinton, B.	1968															X
Hoffer, E.	1967		X					X						X		X
Irwin, D.W. & Rule, E.G.	1988		X	X	X											X

		DIMENSION														
AUTHOR(S)	**DATE**	**CH**	**MO**	**FR**	**IS**	**DY**	**LI**	**PL**	**HU**	**DE**	**TR**	**OP**	**CO**	**RT**	**IT**	**OT**
Kanter, R.M.	1986	X		X	X	X	X	X		X		X				X
Lehman, H.C.	1953	X	X		X	X	X									X
Lieberman, J.N.	1965		X	X				X	X							X
Lieberman, J.N.	1967		X	X				X	X							X
Maslow, A.H.	1971		X	X	X	X	X	X	X		X	X	X	X	X	X
Mumford, M. D. & Gustafson, S. B.	1988	X	X	X	X			X			X	X		X		X
Osborn, A.F.	1953	X	X	X	X	X	X				X	X			X	X
Peavy, V.R.	1979		X	X				X			X	X			X	X
Roe, A.	1958		X	X	X	X	X	X	X		X	X			X	X
Rogers, C.R.	1954		X	X	X			X		X	X	X		X		X
Rogers, C.R.	1961	X		X		X	X	X		X	X	X				
Stein, M. I.	1953		X	X												X
Stein, M.I.	1974	X	X	X	X			X	X				X	X		X
Stein, M.I.	1975		X	X	X					X	X	X	X	X		X
Stein, M.I.	1985	X	X	X				X							X	X
Taylor, I.A.	1975	X	X	X	X			X		X	X	X	X	X		X
Taylor, I.A.	1976		X	X				X		X		X				X
Torrance, E.P.	1962a	X		X	X											X
Torrance, E.P.	1979		X	X	X	X	X	X	X	X	X	X	X	X	X	X
VanGundy, A.G	1984	X	X	X	X			X	X		X	X	X	X	X	X
Wesenberg, P.	1986		X	X							X					X
Winslow, E.K.	1990	X	X	X							X			X		X
Ziv, A.	1976								X							X
TOTAL		**23**	**37**	**41**	**23**	**15**	**13**	**28**	**13**	**12**	**20**	**22**	**14**	**25**	**14**	**45**

KEY

CH= Challenge
FR= Freedom
IS= Idea-Support
LI= Liveliness
PL= Playfulness
DE= Debate
TR= Trust
CO= Conflict
RT= Risk-Taking
DY= Dynamism
MO= Motivation
OP=Openness
HU= Humor
OT= Other

Isaksen and Lauer also examined the content validity of the CCQ in two unpublished studies. Both studies used a Q-sort procedure to test the content (i.e., climate dimensions) used in the CCQ. The first Q-sort was done in 1989 with a class of creative studies graduate students. In this study, the students were given the 50 items of the measure on 50 individual slips of paper.

However, half the class received the original translation of the instrument (CCQ IA) while the other half received the revision of the instrument (CCQ IIA) that was in progress at the time. All the students were given a copy of the climate dimensions and their respective definitions.

The students were then asked to sort the items listed on the 50 slips of paper into the dimension that it seemed to assess. Once the students were done, they were asked to bundle their sorts and label each with the dimension it appeared to measure. The results suggested that for both measures the items were sorted into the correct dimension. The small number of items that were not consistently sorted correctly were noted and revised for inclusion into the CCQ IIA.

The second Q-sort was conducted during the 1990 Creativity Conference held in Buffalo, NY. The same procedure used with the graduate students was used in this study. The subjects of this study were four established creativity scholars. Two performed a sort on the CCQ IA while the other two sorted the items of CCQ IIA. The results of their sorts suggested that the items of both versions of the instrument could be sorted into their intended dimension. In the instances where the items were sorted incorrectly, it was found that the cause related to the wording of the item or the close relationship among the climate dimensions.

The results of these two unpublished studies provided support that items in both versions of the CCQ could be linked to the dimension they were intended to measure. These results added further support to the content validity of the CCQ translations.

In summary, the initial translations of the Swedish CCQ into English, and the analyses conducted on these, provided the foundation for further research and development. The next chapter in this section will report the third version of the translation called the Climate for Innovation Questionnaire.

CHAPTER 3
CLIMATE FOR INNOVATION QUESTIONNAIRE

The purpose of this chapter is to document the development of the CIQ IIIA, and the results of the modifications and the impact on the instrument's reliability. The revision occurred in 1991, and entailed some editing of items, changing the order of items, removing the omnibus item and increasing the number of items from 50 to 60.

The revision was done in part through the use of statistical analysis of the CCQ IIA. The techniques included item and dimension distributions, item and dimension correlations, and the assessment of the internal reliability and factor analyses. Previous analysis of the psychometric properties of the initial translations suggested modifications could improve the instrument.

Examination by Isaksen, Kaufmann, Joniak, Lauer, Murdock, Dorval, and Puccio identified some areas of concern with the language of the items. This group of researchers also felt that the results of the statistical analysis of CCQ IA and CCQ IIA could be used in tandem. The resulting cross comparison identified the best items and dimensions from each of the previous instruments and this provided a basis for the modifications that produced CIQ IIIA.

The resulting CIQ IIIA included items from the Risk-Taking dimension of CCQ IA since these items had acceptable distributions and the scale had a high internal reliability. The descriptions of some CIQ IIIA dimensions were re-written at this time to clarify what the items were measuring. A slightly later refinement to the CIQ IIIA was the addition of three open response questions to the instrument. These narrative items were designed for qualitative analysis. A description of their development and the analysis method is contained in Chapter 1 within this resource.

The questions of CIQ IIIA were also shuffled so that respondents would not identify a pattern. In other words, instead of numbering the Risk-Taking items as 1, 11, 21, 31, and

41, and another dimension's items as 2, 12, 22, 32, and 42, they were sequenced randomly so no obvious pattern emerged in the sequence of items.

Psychometrics of the CIQ IIIA

The CIQ IIIA was a 60 question pen-and-paper self-report instrument. It required subjects to respond to each item from the perspective of their immediate work environment using a Likert type scale from 0 to 3. All items were stated in the affirmative. Each item ranged from "not at all applicable" to "applicable to a high degree" (there was no neutral point).

Each dimension of the CIQ IIIA contained 6 questions that were totaled and divided by six to provide a mean score for each dimension. If responses to one of the six items were missing, dimensional scores were still tabulated; the five items were totaled and divided by five. However, if any dimension had less than four items, then they were determined as incomplete and hence, were not calculated.

Procedures

Instructions for completing the instruments, demographic questions, and a code of ethics were mailed to the organizations.

Participation was voluntary and respondents were assured that their answers were confidential. Subjects were informed that data was being gathered for research purposes and to assist their organization in its change efforts. Moreover, they were informed that the purpose of the CIQ is to develop a better understanding of their personal perceptions of the environment in which they work. Course participants were asked to return the instrument to Isaksen in sealed envelopes.

Only the completed instruments were scored. The results were tabulated on an individual, group, and/or organizational basis. The scores that were tabulated as an aggregate were referred to as the 'overall' group (n=1297).This information was used

in each CPS program. Trained individuals scored all the assessments. Original scoring protocols for CIQ IIIA data followed a priori scales developed from the theoretical framework described earlier.

Subjects

The majority of subjects in this wave of study were also individuals (n=1297) of organizations that contracted with Isaksen for Creative Problem Solving (CPS) Training (see Table 34). The data were collected from September 1991 to April 1994. These subjects comprised of 849 (65.5%) men and 397 (30.6%) women. There were 51 (3.9%) subjects that did not state their gender. The age of the subjects ranged from 20 to 61 years. The mean age of the subjects was 38.8 years. The educational level of the subjects were as follows: (a) High School (n=171), (b) Some College (n=200), (c) Bachelors Degree (n=424), (d) Some Graduate (n=6), (e) Masters Degree (n=276), and Doctorate (n=129). There were subjects that did not report their educational levels (n=91).

From the sample size (n=1297), 297 subjects were from an international household product manufacturer; 289 subjects were from an oil company; 133 subjects from a chemical company; 96 subjects from the banking industry; and 149 subjects from the auto industry. The other areas of function that were not specified on Table 34 included subjects totaling less than 4 each.

The organizational levels ranged from hourly employees (n=178) to top executives such as Vice Presidents, Directors, Board-Level Professionals (n=3). Some subjects identified their organizational levels as Upper Middle (n=38) such as Department Managers, Plant Superintendents, and Plant Managers. The majority of subjects identified themselves as Middle Management (n=197), which consisted of Office Managers, Mid-level Administrators, and Department Chairs, and First Level Supervision (n=200), which consisted of a Fore Persons, Crew Chiefs, Section Supervisors, Faculty, and Staff. Several subjects (n=681) did not report their level within the organization. The means and standard deviations for the overall sample are provided in Table 35.

Table 34
Group Make-Up: Subjects and Frequency Percentages for CIQIIIA

Organization	Subjects (n)	Frequency %
Educational Samples		
Creative Studies Classes	244	18.7
Special School District Programs	89	6.9
Education Group Total	*333*	*25.6*
Business Samples		
International household product manufacturer-conference	297	22.9
Oil Company Programs	289	22.3
Chemical Company Programs	133	10.3
Bank Industry	96	7.4
Auto Industry	149	11.5
Business Group Total	*964*	*74.4*
Overall Total	**1297**	**100%**

Again, some subjects were deleted from the data analysis due to incomplete responses to CIQ IIIA items. The number excluded was contingent upon the type of statistical analysis utilized and whether the analysis used the 60 question items of the CIQ IIIA or the accumulation of these question items into one of the 10 dimensions.

Table 35
CIQ IIIA Scale Norms: Means and Standard Deviations

CIQ IIIA Dimension	Mean	Std. Dev.	n
Challenge	231.04	53.23	1297
Freedom	167.40	61.34	1297
Dynamism	178.62	54.11	1297
Trust/Openness	158.11	56.79	1297
Idea-Time	125.94	64.43	1297
Playfulness/Humor	161.36	63.88	1297
Conflict	107.98	67.23	1297
Idea-Support	175.88	63.44	1297
Debate	187.09	57.87	1297
Risk-Taking	126.86	53.09	1297

Distribution of Scores

The distribution of the CIQ IIIA scales is given in Tables 36 to 45. The Risk-Taking dimension (see Table 36) shows a more than normally peaked curve (leptokurtic). This distribution may signify that the respondents selected scores that were more towards the middle. The central tendency scores yielded a mean of 126.86, a median of 117.00, and a mode score of 100.00. The standard deviation for the Risk-Taking dimension was 53.08.

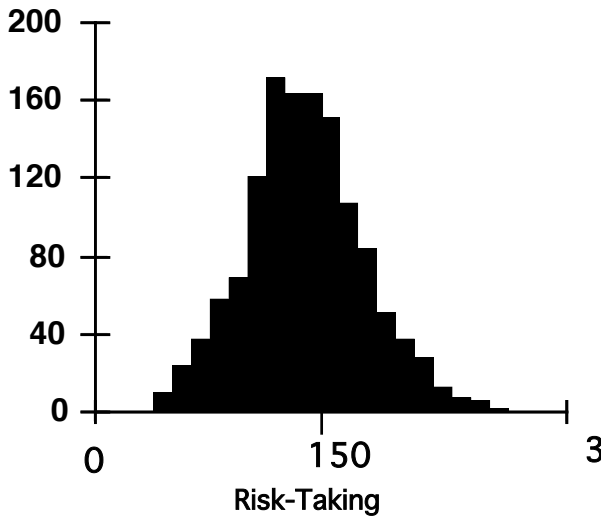
The Idea-Time dimension (see Table 37) also showed a more than normally peaked curve (leptokurtic) with a slight positive skew. Its central tendency scores yielded a mean score of 125.94, median score of 117.00, and a mode score of 100.00. The standard deviation for the Idea-Time dimension was 64.43.

The Debate dimension (see Table 38) yielded a distribution curve that was slightly skewed positive. The central tendency scores consisted of a mean score of 187.08, a median score of 200.00, and a mode score of 200.00. On the curve's left tail, it shows

a series of low scores. Moreover, a score peaks sharply close to the curve's center point. The standard deviation for the Debate dimension was 57.87.

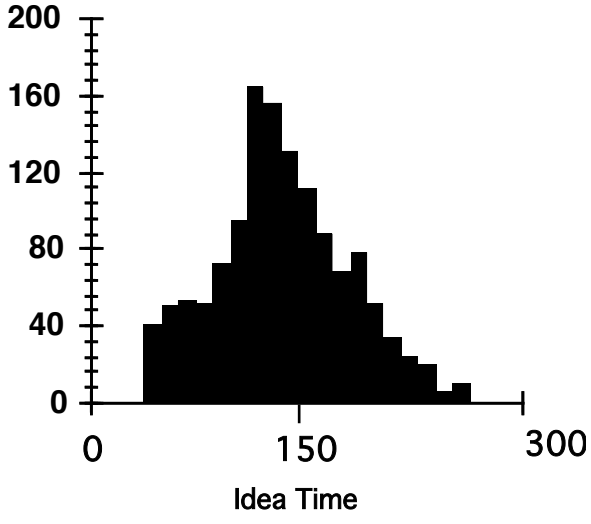
The Playfulness/Humor dimension (see Table 39) yielded a fairly normal unimodol distribution (mesokurtic) of scores. Its central tendency scores consisted of a mean score of 161.36, a median of 167.00, and a mode score of 183.00. One can stipulate that respondents selected a normal share of scores from the Likert scales of the CIQ IIIA. The standard deviation for the Playfulness/Humor dimension was 63.87.

Table 36

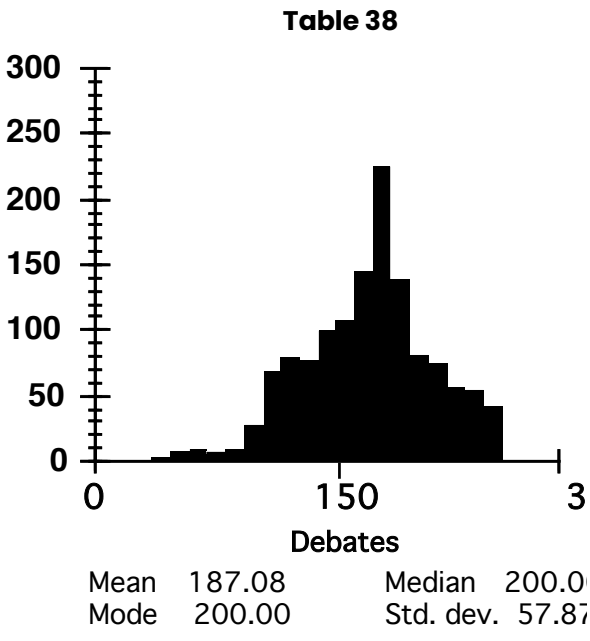


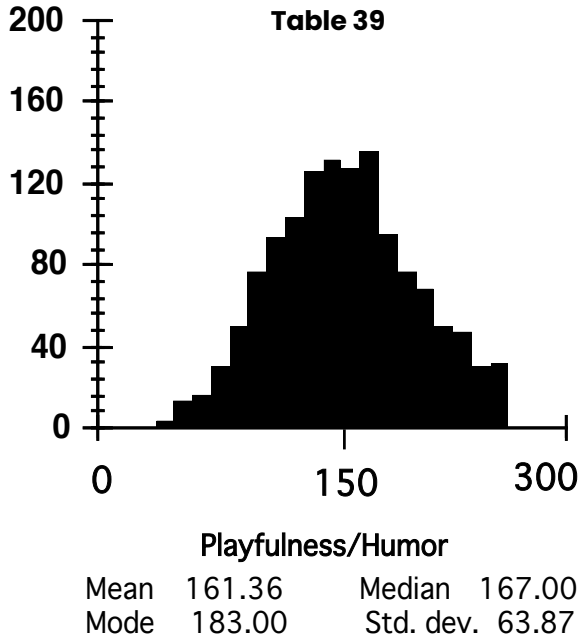
Mean 126.86 Median 117.00
Mode 100.00 Std. dev. 53.08

Table 37



Mean 125.94 Median 117.00
Mode 100.00 Std. dev. 64.43

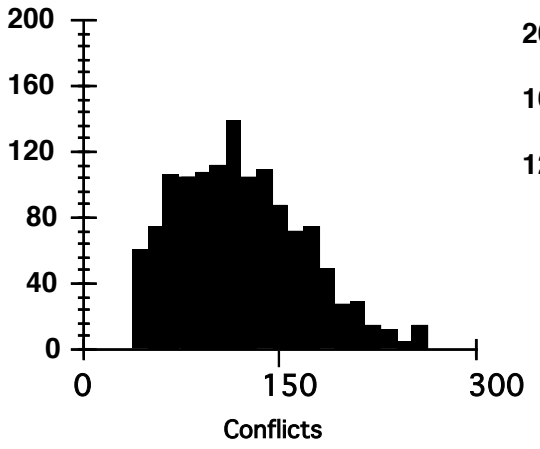




The frequency distribution for the Conflict dimension (see Table 40) reflected a positive skew. The majority of the scores fell below the theoretical mean of 150.00. It appears the respondents had a tendency to select lower scores on the Likert scale of the CIQ IIIA to questions pertaining to the conflict dimension. The central tendency scores consisted of a mean of 107.98, a median of 100.00, a mode score of 100.00. The standard deviation for the Conflict dimension was 67.22.

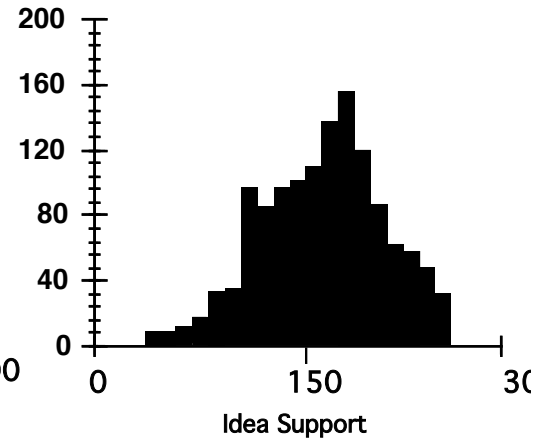
The Idea-Support dimension yielded a distribution of scores that skewed towards the negative. Moreover, its measures of central tendencies varied between 8 to 25 points. As shown on Table 41, the Idea-Support dimension yielded a mean score of 175.88, a median score of 183.00, and a mode of 200.00. The standard deviation for the Idea-Support dimension was 63.44.

Table 40



Mean 107.98 Median 100.00
Mode 100.00 Std. dev. 67.22

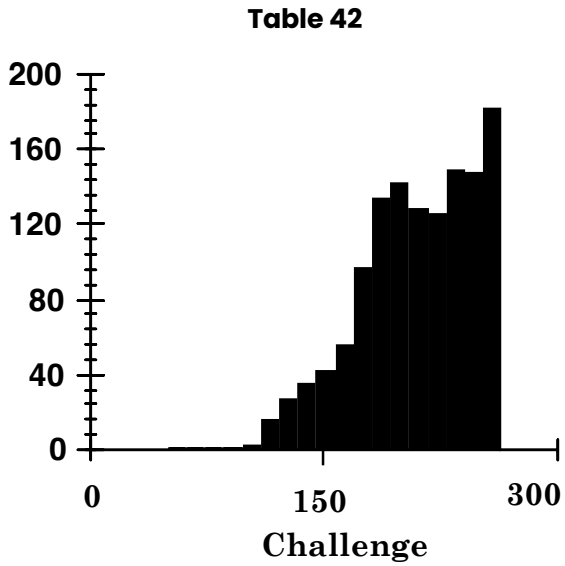
Table 41



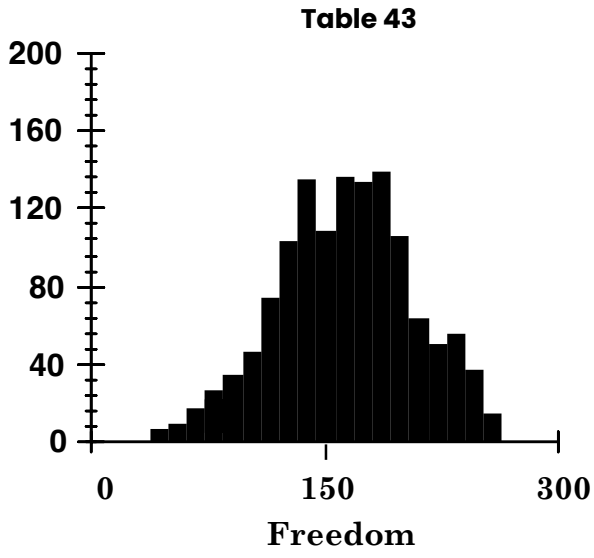
Mean 175.88 Median 183.00
Mode 200.00 Std. dev. 63.44

The distribution scores of the Challenge dimension (see Table 42) yielded an extreme negative skew. It was clear that the respondents selected higher scores on questions that pertained to this dimension. The measure of central tendency revealed a mean score of 231.04, which is over 80 points higher than the theoretical mean of 150.00. The mode resulted in a score of 300.00. This score indicates the score value that occurs more often than any other score (Jaeger, 1990) within the challenge dimension. The median was 233.00. The standard deviation for the Challenge dimension was 53.22.

The Freedom dimension (see Table 43) yielded a fairly normal distribution of scores. As a result one can stipulate that respondents are selecting a normal share of scores from the Likert scale of the CIQIIIA. The scale frequencies yielded a mean of 167.40, a median score of 167.00 and a mode score of 200.00. The standard deviation for the Freedom dimension was 61.34.

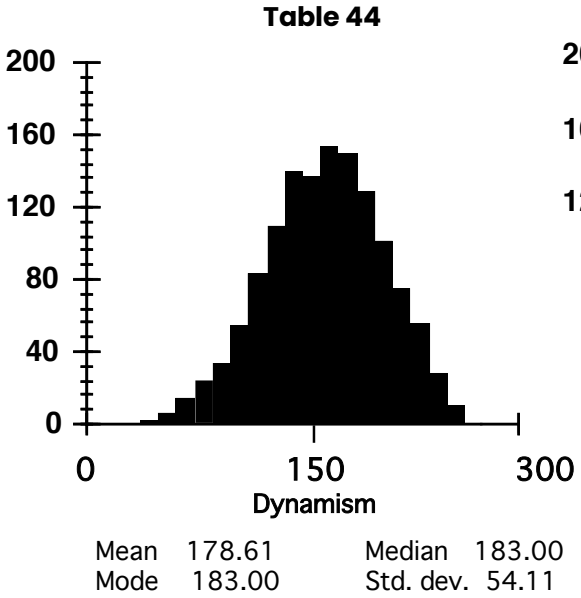


Mean 231.04 Median 233.00
Mode 300.00 Std. dev. 53.22

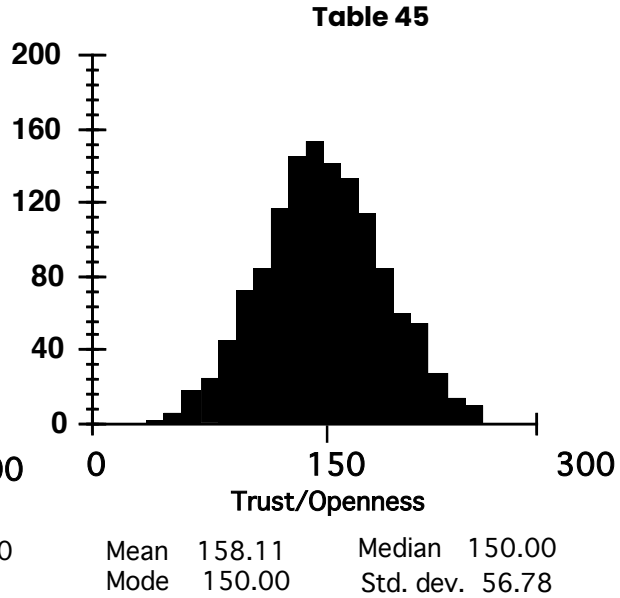


Mean 167.40 Median 167.00
Mode 200.00 Std. dev. 61.34

The Dynamism dimension (see Table 44) yielded a fairly normal distribution of scores with a slight negative skew. Its measure of central tendency consisted of a mean score of 178.61, a median score of 183.00, and a mode score of 183.00. The standard deviation for the Dynamism dimension was 54.11.



Mean 178.61 Median 183.00
Mode 183.00 Std. dev. 54.11



Mean 158.11 Median 150.00
Mode 150.00 Std. dev. 56.78

The Trust/Openness dimension (see Table 45) yielded a normal distribution (mesokurtic). Its measure of tendency resulted in a mean score of 158.11, a median score of 150.00, and a mode score of 150.00. The standard deviation for the Trust/Openness dimension was 56.78.

Correlational Analysis

Table 46 shows the correlations among the dimensions for the entire sample (n=1297). Except for the conflict dimension, the level of significance for each correlation was very strong at p<.01. The results showed that the dimensions had a positive relationship to each other; the only exception was the scores to the Conflict dimension. The correlational coefficients ranged from -.58 to .65.

Table 46
Inter-correlations Between Scales of the CIQ IIIA (n=1297)

Dimension	1	2	3	4	5	6	7	8	9	10
Challenge/Involvement	**1.00**									
Freedom	.48	**1.00**								
Dynamism	.63	.56	**1.00**							
Trust/Openness	.56	.47	.54	**1.00**						
Idea-Time	.36	.58	.43	.39	**1.00**					
Playfulness/Humor	.43	.51	.52	.50	.54	**1.00**				
Conflict	-.43	-.34	-.35	-.58	-.33	-.41	**1.00**			
Idea-Support	.60	.58	.63	.60	.61	.57	-.52	**1.00**		
Debate	.44	.52	.55	.49	.51	.51	-.32	.65	**1.00**	
Risk-Taking	.39	.60	.57	.44	.57	.52	-.27	.63	.63	**1.00**

Cabra (1996) presented the inter-correlations of the CIQ IIIA's 60 questions for the entire sample (n = 1297). Of these correlations 98.6% (1280 of 1297) were significant at a level p< .05. Cabra reported that this suggested that the factors measured by these question items were similar. However, this may still pose a concern if the similarities are deemed too strong (collinear).

Factor Analysis

Table 47 presents the results of the principal component (varimax rotation) analysis yielding ten factors, accounting for approximately 60.2% of the variance. The first factor (Challenge/Involvement), accounted for 32.1% of the total variance; the second factor (Idea-Time) accounted for 6.1%; the third factor (Playfulness/Humor) accounted for 4.3; the fourth factor (Debate) accounted for 3.5%; the fifth factor (Conflict) accounted for 3.4%; the sixth factor (Idea-Support) accounted for 2.8%; the seventh factor (Freedom) accounted for 2.4%; the eighth factor (Risk-Taking) accounted for 2.1%; the ninth factor (Trust) accounted for 1.8%; and, the tenth factor (attracting items from four of the dimensions) accounted for 1.7% of the total variance.

Table 47
Principal Component (Varimax Rotation) Analysis of CIQ IIIA Items

Item	Theoretic Scale	Component (n= 1297)									
		1	2	3	4	5	6	7	8	9	10
47	Challenge	.772									
20	Challenge	.736									
1	Challenge	.701									
30	Challenge	.640									
14	Challenge	.629									
2	Dynamism	.578									.334
34	Challenge	.578					.344				
28	Trust	.460				.425					
23	Idea-Time		.778								
36	Idea-Time		.771								
60	Idea-Time		.771								
43	Idea-Time		.714								
3	Idea-Time		.626								
16	Idea-Time		.572								
44	Playfulness/Humor			.761							
37	Playfulness/Humor			.734							
24	Playfulness/Humor			.727							
9	Playfulness/Humor			.682							
51	Playfulness/Humor			.657							
17	Playfulness/Humor			.549							
35	Dynamism	.421		.507							
15	Trust			.383							
25	Debate				.772						
12	Debate				.730						
39	Debate				.701						
46	Debate				.698						
5	Debate				.675						
26	Risk-Taking				.435		.302		.338		
59	Debate				.421		.362			.314	
38	Conflict					-.736					
10	Conflict					-.722					
31	Conflict					-.704					
55	Conflict					-.686					
52	Conflict					-.684					
4	Conflict					-.608					
56	Idea-Support						.611				
18	Idea-Support						.607				
33	Idea-Support						.598				
11	Idea-Support						.590				
45	Idea-Support						.565				
29	Idea-Support	.372					.524				
53	Dynamism						.386		.370		
57	Dynamism						.358				
19	Risk-Taking						.332		.303		
21	Freedom							.690			
41	Freedom							.689			
48	Freedom							.685			
27	Freedom							.623			
6	Freedom							.620			
50	Freedom						.385	.411			
49	Risk-Taking								.681		
40	Risk-Taking								.571		

32	**Risk-Taking**								.515		
54	**Trust**									.771	
58	**Trust**									.703	
42	**Trust**					.301				.614	
7	**Dynamism**	.318									.493
8	**Trust**			.372							.439
22	**Challenge/Involvement**	.394									.404
13	**Risk-Taking**				.319						.340
% Variance Accounted for by Factors		32.1	6.1	4.3	3.5	3.4	2.8	2.4	2.1	1.8	1.7
Eigenvalues		19.2	3.6	2.6	2.0	2.0	1.6	1.4	1.2	1.0	1.0

Table 48
Maximum Likelihood (Oblimin Rotation) Analysis of CIQ IIIA Items
Component (n= 1297)

		Component (n= 1297)								
Item	Theoretic Scale	1	2	3	4	5	6	7	8	9
18	Idea-Support	.646								
11	Idea-Support	.624								
45	Idea-Support	.504								
33	Idea-Support	.485								
56	Idea-Support	.472								
29	Idea Support	.365								
10	Conflict		.677							
38	Conflict		.676							
31	Conflict		.646							
55	Conflict		.637							
52	Conflict		.592							
4	Conflict		.521							
60	Idea-Time			-.812						
36	Idea-Time			-.804						
23	Idea-Time			-.734						
43	Idea-Time			-.639						
3	Idea-Time			-.489						
16	Idea-Time			-.416						
44	Playfulness/Humor				-.747					
37	Playfulness/Humor				-.714					
24	Playfulness/Humor				-.699					
9	Playfulness/Humor				-.635					
51	Playfulness/Humor				-.582					
17	Playfulness/Humor				-.466					
35	Dynamism				-.429	.341				
8	Trust				-.270					
15	Trust				-.260					
47	Challenge					.732				
20	Challenge					.703				
1	Challenge					.638				
14	Challenge					.553				
2	Challenge					.548				
30	Challenge					.543				
34	Challenge					.442				
22	Challenge					.372				
28	Trust		-.304			.324				
7	Dynamism					.281				
21	Freedom						.748			
48	Freedom						.674			
6	Freedom						.625			
41	Freedom						.604			
27	Freedom						.590			
50	Freedom						.367			
25	Debate							-.801		
12	Debate							-.706		
46	Debate							-.693		
39	Debate							-.669		
5	Debate							-.614		
26	Risk-Taking							-.333		
59	Debate							-.323		
58	Trust								.712	

54	Trust								.607	
42	Trust								.504	
40	Risk-Taking									-.498
32	Risk-Taking									-.461
49	Risk-Taking									-.414
53	Dynamism									-.303
19	Risk-Taking									
57	Dynamism									
13	Risk-Taking									
	% Variance Accounted for by Factors	31.3	5.3	3.5	2.8	2.7	1.9	1.5	1.4	1.0
	Eigenvalues	18.7	3.1	2.0	1.7	1.6	1.1	.89	.85	.61

Table 48 presents the results of the Maximum Likelihood (oblimin rotation) analysis yielding nine factors accounting for approximately 51.4% of the variance. The first factor (Idea-Support), accounted for 31.3% of the total variance; the second factor (Conflict) accounted for 5.3%; the third factor (Idea-Time) accounted for 3.5%; the fourth factor (Playfulness/Humor) accounted for 2.8%; the fifth factor (Challenge/Involvement) accounted for 2.7%; the sixth factor (Freedom) accounted for 1.9%; the seventh factor (Debate) accounted for 1.5%; the eighth factor (Trust) accounted for 1.4%; and the ninth factor (Risk-Taking) accounted for 1.0% of the total variance.

The analysis of the two factor structures provided evidence that a nine-factor solution was a better fit than a ten-factor solution.

Internal Reliability

The results of the three statistical analyses (Cronbach's Alpha, Guttman split-Half, and Spearman Brown) are presented in Table 49. The results were all greater than or equal to .70. The exception was the Trust/Openness dimension with a Guttman split-half score of .59 and a Spearman Brown score of .60. It can be concluded that the construct, in general, was being assessed.

Table 49
CIQ IIIA

Theoretic Scale	Cronbach's Alpha	Guttman split-half	Spearman Brown
Challenge	.85	.85	.85
Freedom	.84	.84	.84
Dynamism	.72	.72	.72
Trust/Openness	.74	.59	.60
Idea-Time	.88	.85	.85
Playfulness/Humor	.88	.85	.85
Conflicts	.84	.84	.84
Idea-Support	.89	.89	.89
Debate	.87	.84	.84
Risk-Taking	.77	.74	.74

This section described the results from the following statistical procedures: (a) Cronbach's Alpha (b) Guttman split-half, and (c) Spearman Brown. The purpose was to determine the internal reliability of the CIQ IIIA measure.

Validity of the CIQ IIIA

Two independent researchers examined the validity of the CIQ IIIA. The first researcher examined the relationship of the CIQ IIIA to stress. The second researcher examined the relationship of the CIQ IIIA to the social environment at work.

Creative Climate and Stress

Occupational stress has been a topic of interest to many researchers (Cooper, Sloan, & Williams, 1988). Talbot, Cooper and Barrow (1992) set out to explore the relationship between perceptions of the climate dimensions and the level of occupational stress

reported by employees. Specifically, these researchers set out to examine whether people who perceived lower levels of the climate dimensions in their work place (except for conflict which is reversed) reported higher levels of occupational stress and vice versa.

Talbot et al., (1992) surveyed 202 employees within the service division of a multinational equipment and systems company. All employees surveyed within this study worked in the United Kingdom. The sample consisted of employees (mostly male) from five job levels (i.e., 47 Operators, 86 Supervisors, 33 Line Managers, 22 Staff Managers and 14 Senior Managers).

The CIQ IIIA was used to measure perceptions of the climate dimensions. Occupational stress was measured through use of the Sources of Pressure in Your Job (SPIYJ; Cooper et al., 1988). The stress measure examined six different sources of pressure: Factors Intrinsic to the Job; Managerial Role; Relationships with Others; Career and Achievement; Organizational Structure and Climate; and Home/Work Interface. The stress subscales are described briefly in Table 50.

Table 50
Sources of Pressure in Your Job

Factors Intrinsic to the Job - The job itself, including variety of work, working hours, making important decisions, etc.
Managerial Role - This includes role ambiguity, role conflict, role changes, etc.
Relationships with Others - Dealing with people in the organization: office politics, meetings, lack of encouragement, etc.
Career and Achievement - Current career advancement and the way the organization recognizes and rewards people.
Organizational Structure and Climate - The way the organization functions and its design and climate.
Home/Work Interface - Conflict in the relationship between home life and work life.

Talbot et al., (1992) used Pearson product-moment correlations to examine the degree of relationship between the climate measure and the SPIYJ (see Table 51).

Overall, these results illustrate a close correspondence between the climate dimensions and work-related stress. For all of the climate dimensions, except Conflict, as perceptions of behaviors associated with a climate that nurtures creativity goes down, stress goes up. Conversely, as perceptions of behaviors associated with factors that nurture creativity goes up, stress goes down in a corresponding manner. Although cause and effect cannot be deduced from this correlational study (i.e., this study did not test to see if a poor climate induced higher levels of stress), it does show a strong relationship between a climate that is conducive to creative performance and the amount of stress people experience at work.

Table 51
Pearson Correlations between Stress and Perceptions of Climate
Climate Dimensions (n= 202)

	Climate Dimensions (n= 202)								
SPIYJ	**Challenge/ Involvement**	**Freedom**	**Trust/ Openness**	**Idea-Time**	**Playfulness/ Humor**	**Conflict**	**Idea-Support**	**Debate**	**Risk-Taking**
Job	-.03	-.10	-.09	-.22**	-.15*	.00	-.16*	-.19**	-.15*
Role	-.19**	-.23***	-.23***	-.27***	-.24***	.15*	-.28**	-.21**	-.26***
Rel/Others	-.28***	-.28***	-.40***	-.29***	-.39***	.32***	-.39***	-.28***	-.34***
Car/Ach	-.13	-.12	-.22***	-.18*	-.21**	.21**	-.32***	-.19**	-.19**
Climate	-.30***	-.24**	-.35***	-.31***	-.31***	.29***	-.44***	-.23***	-.29***
Home/Work	-.02	-.19**	-.02	-.04	-.09	-.04	-.07	-.10	-.10
Total Stress	-.20**	-.25***	-.26***	-.27***	-.29***	.19**	-.35***	-.25***	-.28***

* p < .05 ** p < .01 *** p < .001

Further support for the concurrent validity of CIQ IIIA is provided by the different magnitudes of the correlations found in Table 51. Specifically, the two sources of stress that were most strongly related to the climate dimensions were Relationships with Others and the Organizational Structure and Climate. The CIQ IIIA was designed to measure climate by asking the respondent to comment on the behaviors of others. Thus, to complete the climate measure the respondent must think about his or her interactions with co-workers. It is not surprising that stress associated with how the respondent deals with others was highly related to the climate dimensions.

There is an obvious conceptual link that supports the strong correlations between the climate dimensions and the Organizational Structure and Climate subscale of the SPIYJ. The items contained within this subscale focus on such issues as "Feeling isolated" and "Staff shortages and unsettling turnover rates". This stress subscale examines stress that is due to the organizational environment, much like the CIQ IIIA.

Finally, the fact that only one of the climate dimensions, Freedom, yielded a significant relationship with the Home/Work Interface subscale provides additional support for the validity of the CIQ IIIA. Where this subscale of the SPIYJ focuses directly on the stress that might be caused by the interaction between life at work and home, the CIQ IIIA is concerned solely with the climate conducive to creativity in the work place. Thus, it is not surprising that the climate dimensions showed no relationship to this stress subscale. It is interesting that the only dimension to yield a significant relationship with Home/Work Interface was Freedom. This may indicate that amount of freedom at work may influence the nature of the interaction between work and home.

Creative Climate and Social Environment

Turnipseed (1994) carried out a study that examined the relationship between creative climate and the social environment within the work place. In particular, Turnipseed was concerned with investigating the links between social factors at work and factors that enhance organizational innovation. The Work Environment Scale

(Moos, 1986) was used to measure the social environment. This measure is comprised of three dimensions; Relationship Dimensions, Personal Growth Dimensions; and System Maintenance and Change Dimensions. The subscales assessed within each of these dimensions are described in Table 52.

Table 52
Work Environment Scale

Relationship Dimensions
Involvement: The degree to which employees are committed to their jobs.
Peer Cohesion: The degree to which employees are friendly and supportive.
Supervisor Support: The degree to which management shows support for employees, as well as the extent to which management encourages employees to support one another.
Personal Growth Dimensions
Autonomy: The degree to which employees are encouraged to make decisions and to be self-sufficient.
Task Orientation: The degree to which good planning, efficiency, and getting the job done are emphasized.
Work Pressure: The extent to which pressure and time urgency are relevant in the work place.

Source: Moos (1986)

System Maintenance and Change Dimensions

Clarity: The degree to which employees know what to expect at work, such as rules and policies.

Control: The degree to which management uses rules and pressures to control workers.

Innovation: The degree to which the organization values variety, change, and new approaches.

Physical Comfort: The extent to which the physical surroundings facilitate a pleasant work environment.

Source: Moos (1986).

The employees involved in Turnipseed's study worked in a manufacturing operation of a Fortune 500 company. The sample consisted of 101 employees (51% male and 49% female). The average length of employment was 14 years.

Turnipseed used multiple regression analysis to determine which social work factors were related to the creative climate dimensions. The statistically significant results yielded from this analysis are found in Table 53.

Table 53
Climate Dimensions and Social Environment Factors

Dimension	Beta	P	R^2
Challenge/Involvement			
Involvement	.11	.000	.43
Task Orientation	.08	.000	.51
Freedom			
Autonomy	.11	.000	.19
Trust/Openness			
Peer Cohesion	.11	.000	.25
Autonomy	.07	.000	.34
Idea-Time			
Autonomy	.12	.000	.24
Clarity	.10	.000	.32
Playfulness/Humor			
Involvement	.12	.000	.14
Conflict			
Involvement	-.12	.000	.22
Idea-Support			
Supervisor Support	.14	.000	.34
Innovation	.09	.000	.44
Debate			
Innovation	.07	.000	.16
Peer Cohesion	.06	.000	.21
Risk-Taking			
Autonomy	.06	.012	.14
Innovation	.05	.014	.19

The results of the analysis provide clear support for the concurrent validity of the CIQ IIIA. These results show theoretically sound links between the climate dimensions and social factors in organizations. Involvement, for example, yielded a positive relationship with Challenge and a negative relationship with Conflict. This indicated that as employees experience greater commitment to their work, they also report greater Challenge and less Conflict.

Autonomy showed significant relationships with four of the climate dimensions (Freedom, Trust, Idea-Time, and Risk-Taking). The relationship between Autonomy and Freedom is very understandable as these may be considered synonymous terms. A key element within Autonomy, as described by Moos (1986), is the encouragement employees feel they are given to be self-sufficient and to make decisions. It would seem that trust in others would be necessary for employees to feel as if they could truly work autonomously.

Autonomy was also related to the extent to which employees reported time to develop ideas (Idea-Time). Perhaps providing employees with Autonomy is a crucial factor in permitting them sufficient time to explore and refine ideas. This may give them the freedom to truly carry out their thinking. Further, this suggests that in a tightly controlled work environment, it would be difficult for employees to find the freedom to develop their ideas.

Finally, the relationship between Autonomy and Risk-Taking indicates that as employees feel more self-sufficient the more support they perceive for taking risks at work. Feelings of Autonomy provided the necessary support for employees to make riskier decisions.

Task Orientation was related to only one of the climate dimensions, Challenge. Challenge is the climate dimension that has the strongest focus on daily operations, thus it is not surprising that this was the only climate dimension to relate to Task Orientation. The nature of the relationship between these two variables indicates that as the emphasis on managing tasks well increases, so does employees' perceptions of how challenging and meaningful work is in their unit or organization.

Similarly, only Supervisor Support was related to Idea-Support. Perhaps the most salient figure in regard to the support of one's ideas at work is the supervisor. Therefore, it is not surprising that participants in Turnipseed's (1994) study reported correspondingly higher levels of Idea-Support in reference to the extent of support seen in their supervisor.

Peer Cohesion was significantly related to Trust and Debate. Both of these climate dimensions are focused on interpersonal relationships. Trust emphasizes the

emotional safety an employee feels and Debate focuses on the extent to which employees exchange differing viewpoints. Peer Cohesion refers to how comfortable co-workers are with one another. It focuses on how friendly and supportive the members are towards each other. The extent to which co-workers trust and can engage in debate with one another would seem to have a critical impact, either positively or negatively, on Peer Cohesion.

Innovation, the extent to which new approaches and change are emphasized (Moos, 1986), related significantly to Idea-Support, Debate, and Risk-Taking. The common theme among these three climate dimensions is that they all relate to the voicing of new or different ideas. Idea-Support refers to how new ideas are received. Debate is concerned with the expression of an idea that challenges other individuals' thinking. Risk-Taking is concerned with the degree to which an employee believes he or she can try out a new idea. This common focus on the expression of new thinking appears to be the main thrust of the Innovation subscale of the Work Environment Scale.

Analysis of the social factors measured by the Work Environment Scale showed clear theoretical links to the climate dimensions measured by the CIQ IIIA. These relationships add to the mounting evidence of the CIQ IIIA's validity. Further, although it is not possible to deduce causality from this study, the relationships yielded by this investigation add further information about the nature of the climate dimensions. These relationships provide additional insight into how the dimensions operate within the work place, particularly in reference to social factors found at work. In summary, this third revision to the translation of the Swedish CCQ provided additional opportunities to explore its psychometric properties and relationship to other constructs to examine its validity. We had made clear progress in improving the measure, but more work remained to be done. The next generation of research and development would focus on nine dimensions, with further redefinition of the dimensions to tighten their meaning and improve their clarity. Further, the insight that some participants offered unsolicited narrative comments would lead to the deliberate development and inclusion of three open-ended questions.

CHAPTER 4
EARLIER VERSIONS OF THE SOQ

The purpose of this chapter is to summarize the reliability findings and psychometric properties from three earlier versions of the Situational Outlook Questionnaire® (SOQ). These are identified as SOQ versions 4, 5, and 6. Results for Version 7 of the SOQ are reported in a separate Technical Resource, as it is the current version of the measure. The first three versions of the measure are named differently and summarized elsewhere in this manual. As we have identified previously, the first English translation of the Swedish CCQ was also called CCQ, as was the second English version. The third version was called the Climate for Innovation Questionnaire (CIQ). These previous versions all included 10 dimensions. The new SOQ versions all measured 9 dimensions (Dynamism combined into a newly defined Challenge and Involvement dimension). All SOQ versions also include a qualitative/narrative section.

SOQ Version 4 (1995)

The purpose of this section is to document the development of the present version of the climate measure now known as The Situational Outlook Questionnaire® (SOQ) version 4 and the results of the modifications made on the basis of the initial translation and further developmental efforts on the instrument's reliability and other psychometric properties. This third revision (following the initial translation) to the instrument occurred in 1994. This revision entailed some editing to items, changing the order of items, removing ten items and combining two dimensions.

The revision was done in part through the use of statistical analysis of the CIQ IIIA (Cabra, 1996). The techniques used included item and dimension distributions, item and dimension correlations, and assessment of the internal reliability and factor analysis. Previous examination of the properties of the initial translation and the two subsequent modifications suggested that some improvements could be made to the instrument. The methodology used to develop the SOQ is presented in detail in order to document key steps for each of the versions.

Development

The purpose of this section is to document the development of the SOQ. Detailed descriptions of the modifications made to the measure are also presented.

The initial change that was made on the CIQ IIIA was to delete from the factor analysis the items that had low inter-item correlation and suspect reliability. The suspect items were 49, 53, and 54. These actions did not produce a significant improvement in the factor structure. A subsequent modification was to remove questionable item one based on its high mean and low standard deviation. Additional items were removed as a result of the reliability analysis (Table 54 and Table 55); one item was removed from each of the remaining six dimensions according to its minimal reduction of reliability within its respective dimension. The results of the factor analysis were promising. Based on the way in which some items mis-loaded or did not load past > .25 it was decided to remove another seven items. The result was an eight-factor solution that had a poor structure and some unacceptable reliability.

A sequence of six progressively different item combinations were then analyzed using exploratory factor analysis. The first attempt initiated a factor analysis run without question items 28 and 41; the third attempt initiated a factor analysis without items 1, 8, 13, 15, 26, 35, 53, and 57; the sixth attempt initiated a factor analysis without items 1, 7, 8, 13, 15, 19, 26, 28, 35, 53, and 57. The results of this sequence and the last factor analysis seemed acceptable; however, the reliability of the Risk-Taking dimension was low at .62. Based on this subsequent analysis, another factor analysis was performed without item 19.

The results showed that as a 49-item instrument the factor analysis of the CIQ IIIA was acceptable with 9 distinct factors that accounted for 62.4% of the variance. This allowed for the creation of the SOQ. The loading of item 19 fell below the generally accepted .30 at point .29. The reliabilities were: Challenge/Involvement .85 (7 items); Freedom .84 (3 items); Trust/Openness .67 (3 items); Idea-Time .88 (6 items); Playfulness/Humor .88 (6 items); Conflict .84 (6 items); Idea-Support .89 (5 items); Debate .87 (6 items); and Risk-Taking .69 (4 items). These results were considered

sufficiently acceptable to make the SOQ a 50-item instrument (one lead question that is not scored) with 9 dimensions.

Table 54
CIQIIIA Reliability: Some Items Removed
(n = 1250)

Dimension	Cronbach's Alpha
Challenge/Involvement	.86
Freedom	.84
Dynamism	.72
Trust/Openness	.74
Idea-Time	.88
Playfulness/Humor	.88
Conflict	.84
Idea-Support	.89
Debate	.87
Risk-Taking	.77

Each dimension consists of 6 items

It was evident from the quantitative analysis performed on the measure that the dimension of Dynamism was a weak or poorly represented concept in the CIQ. An explanation may be that the concept of Dynamism in Sweden is seen as the pace and liveliness that exists within the workplace; and every time modifications were made to get this dimension to become a clean independent factor in a North American application, it loaded under the dimension Challenge/Involvement. In the North American culture, to see something as meaningful or as challenging in the place of work, the Challenge dimension is attributed to be one that also has a sense of liveliness and fast pace. As such, the dimension was dropped from the quantitative instrument but since three of the six items designed to measure the dimension consistently loaded on Challenge, and their correlations were significant, it was decided to expand the concept of Challenge to become

Challenge/Involvement. This was developed by highlighting the key words of the items and determining what common theme ran among them.

Table 55
Reliability of the SOQ Derived from Modifications of the CIQ IIIA
(n = 1250)

Dimension	Cronbach's Alpha
Challenge/Involvement	.85 (7 items)
Freedom	.84 (6 items)
Trust/Openness	.67 (3 items)
Idea-Time	.88 (6 items)
Playfulness/Humor	.88 (6 items)
Conflict	.84 (6 items)
Idea-Support	.89 (5 items)
Debate	.87 (6 items)
Risk-Taking	.77 (4 items)

The purpose of this section was to summarize the development of the SOQ. Detailed descriptions of the modifications made to the measure indicated that a nine-dimension measure provided both good coverage of the concept and provided an improvement in the internal consistency of the measure.

Design

The purpose of this section is to describe the design of the SOQ version 4. It presents information that concerns the measure's questions, how they are scored, arranged, and tabulated into a scale.

The SOQ version 4 was a 50-item, pen-and-paper self-report instrument. All versions required subjects to respond to each item using a Likert type scale from 0 to 3, as to how they see an item depicting their work environment. All items were stated

in the affirmative. Each item ranged from “not at all applicable” to “applicable to a high degree” (there was no neutral point).

The items on this measure pertained to one of nine theoretical creative climate dimensions. All items were randomly arranged. Each dimension had its respective number of questions--answered by respondents--that were totaled and divided by the same number of questions. For example, the Freedom dimension had 6 questions that were divided by six to provide the mean score for its dimension. If one of the six question items was missing, dimensional scores were still tabulated; the five remaining items were totaled and divided by five. If an instrument was missing three or more items the instrument was considered invalid and was not used for further analysis or application. The nine dimensions assessed by the SOQ are included in Table 56 below.

Table 56
Dimensions of Creative Climate Assessed by the Situational Outlook Questionnaire®

Dimension	Description	Sample Item
Challenge/ Involvement	The degree of emotional involvement, commitment, and motivation in the operations and goals.	The work atmosphere here is filled with energy.
Freedom	The level of autonomy, discretion, and initiative in behavior exerted by individuals to acquire information, make decisions, etc.	People here make choices about their own work.
Trust/ Openness	The degree of emotional safety, and openness found in relationships.	People here do not steal each other's ideas.
Idea-Time	The amount of time people can use (and do) for elaborating new ideas.	Time is available to explore new ideas.
Playfulness/ Humor	The display of spontaneity, ease, good-natured joking, and laughter that is displayed.	People here exhibit a sense of humor.
Conflict	The presence of personal and emotional tensions or hostilities.	There are power and territory struggles here.
Idea-Support	The degree to which new ideas and suggestions are attended to and treated in a kindly manner.	People usually feel welcome when presenting new ideas here.
Debate	The expressing and considering of many different viewpoints, ideas and experiences.	A wide variety of viewpoints are expressed here.
Risk-Taking	The tolerance of ambiguity and uncertainty.	People here often venture into unknown territory.

The purpose of this section was to describe the measure used in this examination. It presented information that concerned the measure's questions, how they are scored, arranged, and tabulated into a scale.

Procedures

The focus of this section is to describe the procedures utilized to collect and analyze the data in this phase of development.

A sample size of 639 for SOQ version 4 was included in this data analysis. The data were gathered from subjects who participated in Creative Problem Solving training programs. Completion instructions for the instruments, demographic questions, and a code of ethics were mailed to the organizations to distribute to the program participants.

Participation was voluntary and respondents were assured that their answers were confidential. Subjects were informed that data was being gathered for research purposes and to assist their organization in its change efforts. Moreover, they were informed that the purpose of the SOQ is to develop a better understanding of their personal perceptions of the environment in which they work. Course participants were asked to return the instrument to Isaksen in sealed envelopes.

Only the completed instruments were scored. The results were tabulated on an individual, group, and/or organization basis (Lauer, 1994). The scores that were tabulated as an aggregate are referred to as the 'overall' group (n=639). This information was used in each CPS program. Trained individuals scored all instruments.

Subjects

The data for SOQ version 4 were gathered from subjects (n=639) within organizations that contracted with Isaksen for training programs in Creative Problem Solving (CPS). The data were collected between September 1991 and April 1994. These subjects were comprised of 144 (22.5%) men and 108 (16.9%) women. There were 387 (60.6%) subjects that did not state their gender. The age of the subjects ranged from 23 to 52 years. The mean age of the subjects was 34.30 years. The educational level of the subjects were as follows: (a) Some College (n=4), (b) Bachelors Degree (n=21), (c) Some Graduate (n=8), (e) Masters Degree (n=8), and

Doctorate (n=17). There were subjects that did not report their educational levels (n=581).

From the sample size (n=639), 44 subjects were from a manufacturing household products business; 3 subjects were from the service industry; 271 subjects were from an industrial company; 143 subjects were from a food manufacturing company; 172 subjects were from a health-care company; and 6 subjects were from education. The means and standard deviations for the overall sample are provided in Table 57 for items, and Table 58 for dimensions.

Table 57
SOQ 4 Item Norms: Means and Standard Deviations

Overall			
SOQ Item	**Mean**	**Std. Dev.**	**n**
2	182	.76	639
3	98	.82	639
4	166	.98	639
5	190	.75	639
6	136	.78	639
7	189	.76	639
8	112	.93	639
9	149	.78	639
10	169	.73	639
11	224	.74	639
12	101	.92	639
13	139	.77	639
14	149	.80	639
15	134	.79	639
16	189	.82	639
17	141	.78	639
18	136	.76	639
19	86	.76	639
20	168	.77	639
21	173	.72	639
22	127	.79	639
23	215	.71	639
24	69	.83	639
25	78	.72	639
26	145	.70	639
27	213	.74	639
28	99	.76	639
29	92	.78	639
30	116	.94	639
31	159	.73	639
32	105	.79	639
33	169	.79	639
34	103	.87	639
35	78	.72	639
36	157	.78	639
37	135	.78	639
38	171	.70	639
39	221	.71	639
40	114	.74	639
41	107	.84	639

42	130	.74	639
43	116	.86	639
44	151	1.02	639
45	150	1.00	639
46	95	.93	639
47	134	.79	639
48	133	.94	639
49	153	.74	639
50	94	.74	639

With regard to the organizational levels, the sample ranged from top executives (n=4) such as President, Chief Executive Officer, and Operating Officer to Upper middle executives such as Department Executives, Superintendents, Plant Managers, Senior Professional Staff, and Deans (n=99). The remaining subjects were Executives (n=31) such as Vice-Presidents, Directors, Board Level Professionals, and Assistant Superintendents. From the sample size, 505 subjects did not report their organizational level.

Table 58
SOQ 4 Scale Norms: Means and Standard Deviations

Dimension	Mean	Std. Dev	n
Challenge/Involvement	197.17	53.25	639
Freedom	136.37	55.44	639
Trust/Openness	128.83	70.55	639
Idea-Time	92.57	62.49	639
Playfulness/Humor	143.84	61.38	639
Conflict	118.02	72.12	639
Idea-Support	142.41	64.74	639
Debate	169.02	57.39	639
Risk-Taking	106.41	52.68	639

The purpose of this section was to describe the sample that was utilized in this study. The subject's age, education level, gender, and occupation were described in this section.

Distribution

The purpose of this section is to describe the distribution results of the SOQ version 4's dimensions. This distribution takes into account respondents' selection of scores from the creative climate measure. The intent is to determine the extent to which the responses represent a normal distribution. Such information is useful for solving a variety of problems in inferential statistics (Jaeger, 1990) e.g., eliminating items that caused extremely skewed results. These results will be presented and interpretations will be discussed. Since the sample was not random, we did not expect completely normal or mesokurtic distributions. We did, however, need to confirm that the full range of scores were being utilized.

The distribution scores for the Risk-Taking dimension (Table 59) produced a slightly positive skewed curve. Although its shape shows a fairly normal distribution, its measure of central tendency showed otherwise. Specifically, the scores resulted in a mean of 106.41, a median of 100.00, and a mode of 100.00. The standard deviation for this dimension was 52.68.

Table 59

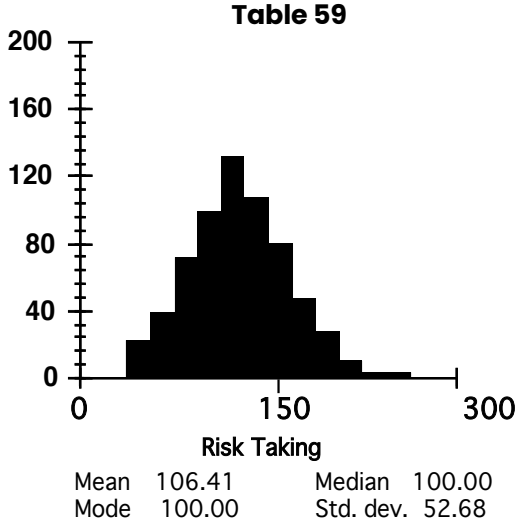
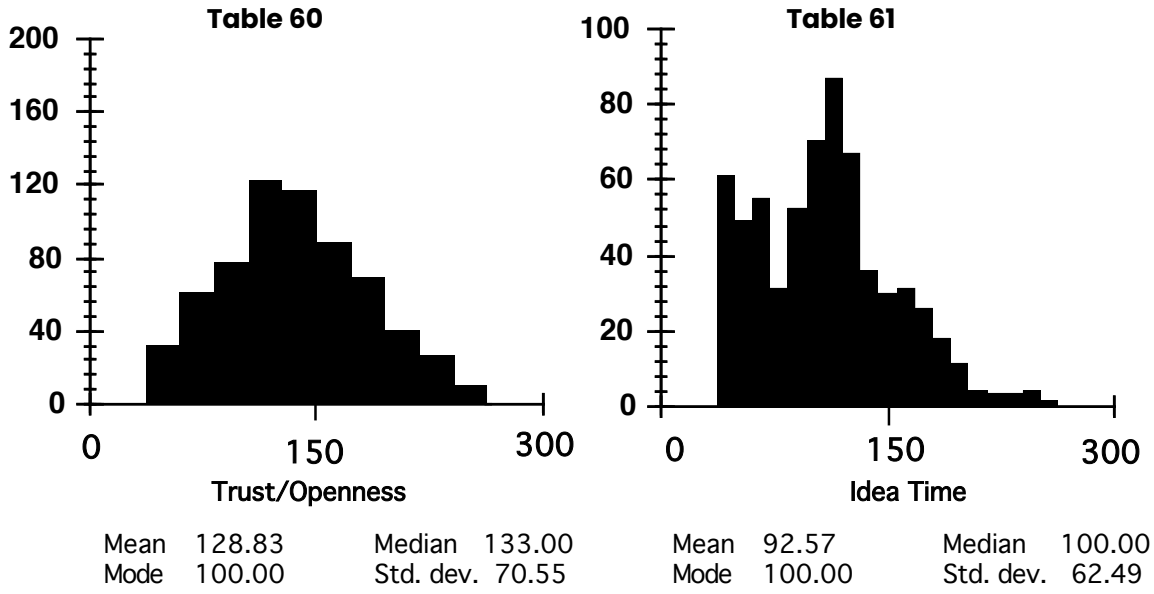


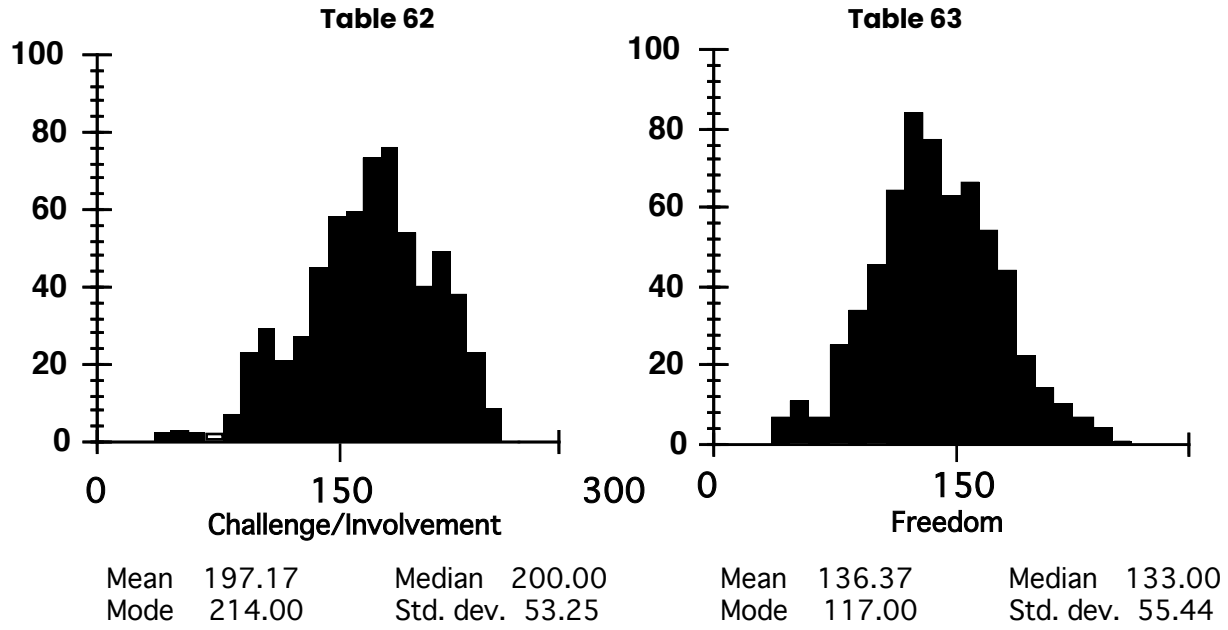
Table 60 contains the distribution scores for the Trust/Openness dimension. It yielded a fairly normal distributed curve with a slight positive skew. Its measure of central tendency resulted in the mean score of 128.83, a median of 133.00, and a mode score of 100.00. The standard deviation for this dimension was 70.6.

The distribution score for the Idea-Time dimension (Table 61) was strongly skewed positive. This curve also appeared to have a slight bimodal shape. Although strictly speaking, this curve does not have two peaks containing a similar height or shape. Its measure of central tendency resulted in a mean score of 92.57, a median of 100.00, and a mode score of 100.00. The standard deviation for this dimension was 62.5.



The Challenge/Involvement dimension (Table 62) yielded a fairly normal distribution with a slight negative skew. Its measure of central tendency resulted in the mean score of 197.17, a median of 200.00, and a mode score 214.00. The standard deviation for this dimension was 53.25.

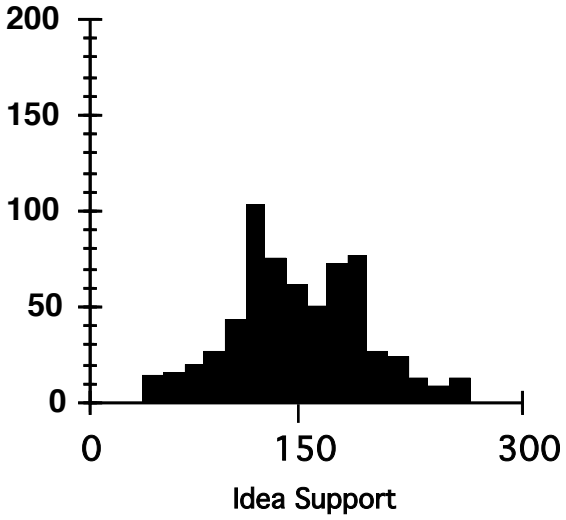
The Freedom dimension (Table 63) produced a leptokurtic distribution of the respondents' scores. In this table there were a larger number of average scores with a few high and low scores on each side. The scale frequencies yielded a mean of 136.37, a median score of 133.00 and a mode score of 117.00. The standard deviation for this dimension was 55.44.



The Idea-Support dimension (Table 64) yielded a fairly normal distribution of the respondents' scores. In this table there were a lot of average scores with a few high and low scores on each side. The scale frequencies yielded a mean of 142.41, a median score of 140.00 and a mode score of 100.00. The standard deviation for this dimension was 64.74.

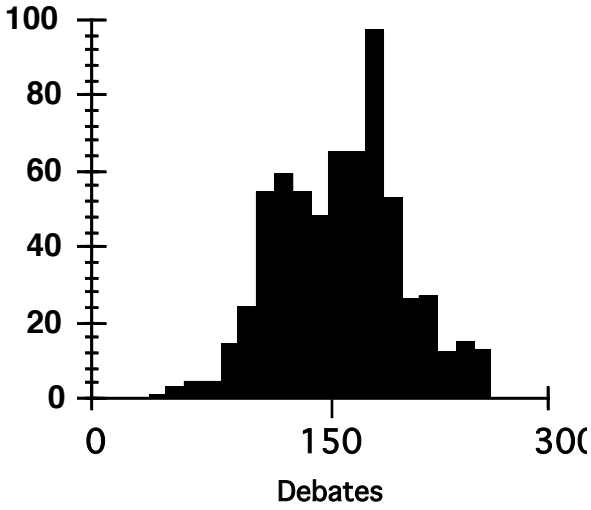
The Debate dimension (Table 65) yielded a fairly normal distribution of the respondents' scores. One peak did exceed the normal curve with a frequency score of 98 and a Likert scale selection of 200, as shown on the table. The scale frequencies produced a mean of 169.02, a median score of 167.00 and a mode score of 200.00. The standard deviation for this dimension was 57.39.

Table 64



Mean 142.41 Median 140.00
Mode 100.00 Std. dev. 64.74

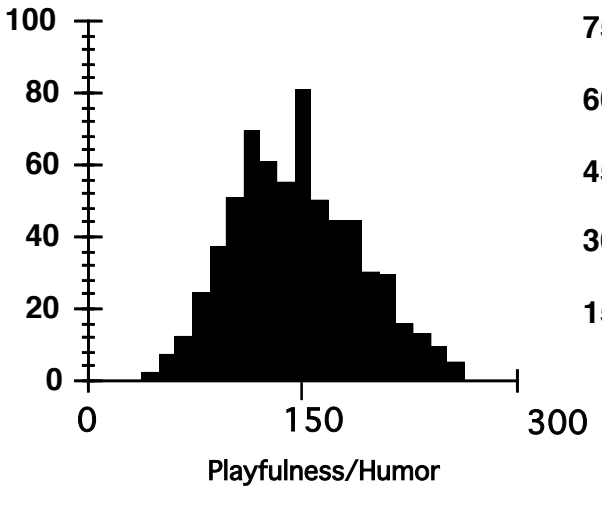
Table 65



Mean 169.02 Median 167.00
Mode 200.00 Std. dev. 57.39

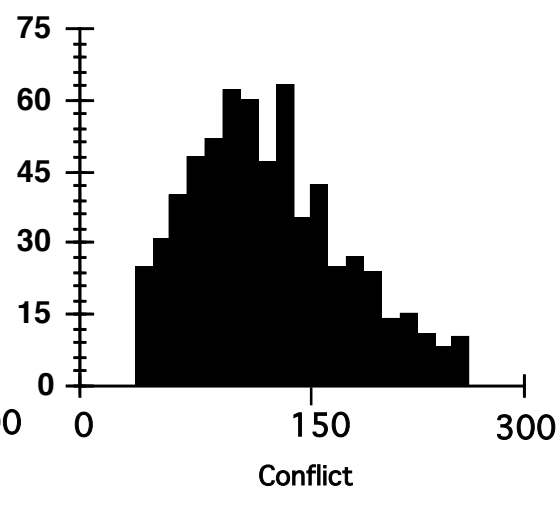
The Playfulness/Humor dimension (Table 66) yielded a fairly normal distribution of the respondents' scores. In this table there were also a large number of average scores with a few high and low scores on each side. The scale frequencies yielded a mean of 143.84, a median score of 150.00 and a mode score of 150.00. The standard deviation for this dimension was 61.38.

Table 66



Mean 143.84 Median 150.00
Mode 150.00 Std. dev. 61.38

Table 67



Mean 118.02 Median 117.00
Mode 133.00 Std. dev. 72.12

The Conflict dimension (Table 67) yielded a negatively skewed distribution. Its central tendency scores resulted in a mean of 118.02, a median of 117.00, and a mode score of 133.00. The standard deviation for this dimension was 72.12.

The purpose of this section was to describe the results of an examination of the SOQ's dimension distributions. Cabra's (1996) examination took into account respondents' selection of scores from the SOQ. The intent was to determine to what extent the responses represented a normal distribution. Since the sample for analysis was composed of a sample of convenience, rather than a random sample from the larger population, we cannot expect a perfectly normal distribution for each scale.

Inter-Dimension Correlations

The purpose of this section is to describe the results from the correlation analysis of the SOQ's dimensions and items. These results are presented and some interpretation is provided.

Table 68 shows the correlations among the dimensions for the entire sample (n=639). Except for the Risk-Taking dimension, the correlations are relatively strong. The smaller correlation of Risk-Taking with Conflict may be the result of the smaller number of Risk-Taking items and lower internal consistency within that scale. The level of significance for each correlation was $p < .01$. The results showed that the dimensions had a positive relationship to each other. The correlation coefficients ranged from -.49 to .65.

Table 68
Inter-Correlations Between Dimensions of the SOQ 4
(n = 639)

Dimension	1	2	3	4	5	6	7	8	9
Challenge/Involvement	1.00								
Freedom	.52	1.00							
Trust/Openness	.40	.35	1.00						
Idea-Time	.30	.59	.26	1.00					
Playfulness/Humor	.40	.45	.34	.49	1.00				
Conflict	-.41	-.37	-.49	-.35	-.41	1.00			
Idea-Support	.52	.61	.44	.62	.60	-.49	1.00		
Debate	.50	.53	.30	.46	.53	-.33	.65	1.00	
Risk-Taking	.36	.54	.28	.40	.41	-.17	.51	.50	1.00

All correlation are significant at p < .01 level

Cabra (1996) reported the inter-item correlations of the SOQ's 50 questions for the entire sample (n= 639). He found that of these correlations 95% (608 of 639) were significant at a level p< .05. This indicated that the factors measured by these question items are similar. Of the 5% of scores that resulted in non-significance 65% stemmed from item 41 (a Risk-Taking item)

The purpose of this section was to describe the results from the correlation analysis of the SOQ dimensions and items. These results were presented and some of their meanings were also discussed.

Factor Analysis

The purpose of this section is to describe the results from the exploratory factor analysis of the SOQ's 50 items. The results and some interpretations are discussed. The discussion focuses mainly on how well the responses to the items reduce to its theoretic structures, as identified by Ekvall and modified by Isaksen and colleagues.

Table 69 shows the results of the Principal Component (varimax rotation) analysis that yielded nine factors accounting for approximately 61.6% of the variance. The first factor (Idea-Time), accounted for 31.4% of the total variance; the second factor (Conflict) accounted for 6.5%; the third factor (Debate) accounted for 5.7%; the fourth factor (Challenge/Involvement) accounted for 4.6%; the fifth factor (Playfulness/Humor) accounted for 3.4%; the sixth factor (Idea-Support) accounted for 2.9%; the seventh factor (Freedom) accounted for 2.8%; the eighth factor (Risk-Taking) accounted for 2.2%; and, the ninth factor (Trust/Openness) accounted for 2.1%.

Table 70 shows the results of the Maximum Likelihood (oblimin rotation) analysis that also yielded nine factors accounting for approximately 52.7% of the variance. The first factor (Idea-Support) accounted for 30.4% of the total variance; the second factor (Idea-Time) accounted for 5.2%; the third factor (Conflict) accounted for 4.9%; the fourth factor (Playfulness/Humor) accounted for 3.8%; the fifth factor (Challenge/Involvement) accounted for 2.6%; the sixth factor (Debate) accounted for 1.8%; the seventh factor (Freedom) accounted for 1.8%; the eighth factor (Trust/Openness) accounted for 1.1%; and the ninth factor (Risk-Taking) accounted for 1.1% of the total variance.

Table 69
Principal Component (Varimax Rotation) Analysis
SOQ version 4 (n = 639)

Theoretic Scale	Component								
	1	2	3	4	5	6	7	8	9
Idea-Time	.800								
Idea-Time	.780								
Idea-Time	.757								
Idea-Time	.756								
Idea-Time	.698								
Idea-Time	.604								
Conflict		-.760							
Conflict		-.738							
Conflict		-.736							
Conflict		-.732							
Conflict		-.671							
Conflict		-.666							
Debate			.772						
Debate			.766						
Debate			.744						
Debate			.727						
Debate			.632						
Challenge/Involvement				.762					
Challenge/Involvement				.714					
Challenge/Involvement				.702					
Challenge/Involvement				.637					
Challenge/Involvement				.632		.296			
Challenge/Involvement				.571					
Challenge/Involvement				.391				.381	
Playfulness/Humor					.780				
Playfulness/Humor					.751				
Playfulness/Humor					.751				
Playfulness/Humor					.721				
Playfulness/Humor					.600				
Playfulness/Humor		.299			.554				
Idea-Support						.627			
Idea-Support	.302					.581			
Idea-Support						.573			
Idea-Support			.327			.547			
Idea-Support	.311					.525			
Debate			.424			.430			
Freedom	.340					.391	.346		
Freedom							.739		
Freedom							.683		
Freedom	.312						.574		
Freedom							.548	.342	
Freedom							.444	.312	
Risk-Taking								.610	
Risk-Taking								.567	
Risk-Taking			.299					.519	

Risk-Taking						−.366		.397	.333
Trust/Openness									.704
Trust/Openness		.371							.568
Trust/Openness		.298							.487
Eigenvalues	15.3	3.1	2.7	2.2	1.6	1.4	1.3	1.0	1.0
% Variance Accounted for by Factors	31.4	6.5	5.7	4.6	3.4	2.9	2.8	2.2	2.1

Table 70
Maximum Likelihood (Oblimin Rotation) Analysis
SOQ version 4 (n = 639)

Theoretic Scale	Component								
	1	2	3	4	5	6	7	8	9
Idea-Support	.762								
Idea-Support	.668								
Idea-Support	.560								
Idea-Support	.493								
Idea-Support	.478								
Debate	.321					-.306			
Freedom	.298								
Idea-Time		.808							
Idea-Time		.795							
Idea-Time		.763							
Idea-Time		.737							
Idea-Time		.605							
Idea-Time		.410							
Conflict			.756						
Conflict			.732						
Conflict			.731						
Conflict			.712						
Conflict			.614						
Conflict			.569						
Trust			-.388						
Trust			-.292						
Playfulness/Humor				-.806					
Playfulness/Humor				-.745					
Playfulness/Humor				-.722					
Playfulness/Humor				-.683					
Playfulness/Humor				-.500					
Playfulness/Humor				-.476					
Challenge/Involvement					.791				
Challenge/Involvement					.694				
Challenge/Involvement					.607				
Challenge/Involvement					568				
Challenge/Involvement					.556				
Challenge/Involvement					.437				
Challenge/Involvement									
Debate						-.750			
Debate						-.745			
Debate						-.726			
Debate						-.715			
Debate						-.545			
Freedom							.622		
Freedom							.557		
Freedom							.553		
Freedom							.520		
Freedom							.413		

Risk-Taking									
Trust								.251	
Risk-Taking									.401
Risk-Taking									.317
Risk-Taking									.272
Eigenvalues	14.8	2.5	2.4	1.8	1.2	.89	.86	.52	54
% Variance Accounted for by Factors	30.4	5.2	4.9	3.8	2.6	1.8	1.8	1.1	1.1

The purpose of this section was to describe the results from the exploratory factor analysis of the SOQ version 4's 50 items. In general, the results from these exploratory factor analyses provide evidence that the items of the SOQ version 4 were loading on their respective theoretical dimensions.

Internal Reliability

The purpose of this section is to describe the results from the following statistical procedures: (a) Cronbach's Alpha (b) Guttman split-half, and (c) Spearman Brown. The purpose is to determine the internal reliability of the SOQ version 4.

The results of the three statistical analyses as presented in Table 71 were nearly all greater than or equal to .70 (a generally accepted target for internal consistency). The exceptions were Risk-Taking with a Cronbach's Alpha score of .59, a Guttman split-half score of .57, and a Spearman Brown score of .57; Trust/Openness with a split-half score .60, a Cronbach's Alpha of .64 and a Spearman Brown score of .64. These results indicate that further development work must be focused on these two scales.

Table 71
SOQ 4 Reliability

Dimension	Cronbach's Alpha	Guttman split-half	Spearman Brown
Challenge/Involvement	.83	.79	.81
Freedom	.81	.81	.81
Trust/Openness	.64	.60	.64
Idea-Time	.88	.86	.86
Playfulness/Humor	.87	.85	.85
Conflict	.86	.85	.85
Idea-Support	.90	.86	.89
Debate	.88	.86	.86
Risk-Taking	.63	.57	.57

The purpose of this section was to describe the results from the following statistical procedures: (a) Cronbach's Alpha (b) Guttman split-half, and (c) Spearman Brown. The purpose was to determine the internal reliability of the SOQ version 4.

SOQ Version 5 (1998)

The purpose of this section is to examine the internal consistency and factor structure of the Situational Outlook Questionnaire® (SOQ) version 5. This examination of the SOQ version 5 was an effort to share the evidence on its psychometric qualities with other scholars and was published by Isaksen, Lauer, and Ekvall (1999). Key findings are summarized below.

Sample

The total sample comprised data collected from 1111 individuals as part of the Creative Problem Solving Group's research efforts. The data was collected between February 1995 and June 1996. The sample includes 392 males and 299 females (420 individuals did not indicate their gender). Six US, one international, and one Canadian organization were included in this sample. A total of 148 individuals worked for a manufacturer of household goods located in the central US (99% response rate); 164 worked for a food manufacturer located in Ontario, Canada (100% response rate); 172 came from a pharmaceutical company located on the northeast coast of the US (95% response rate); 169 from a variety of agencies within a state government located on the northwest coast of the US (90% response rate); 271 from a research and development laboratory within a consumer products manufacturer located on the west coast of the US (99% response rate);6 participants worked in the central office of a national US telecommunications company (100% response rate); 172 worked for a direct mail company with offices in the US, Great Britain, Germany, France, Australia, and Sweden (86% response rate); and 9 were students involved in a master's degree seminar course held at a north east college in the US (100% response rate).

Development

The SOQ version 5 was a paper-and-pencil self-report measure and also became available on the web in 1998. It assessed nine of the ten dimensions measured by

Ekvall's Creative Climate Questionnaire. Factor analysis of earlier versions of the SOQ showed that one of Ekvall's dimensions, Dynamism/Liveliness, did not clearly emerge as a separate dimension in English-speaking cultures. Many of the Dynamism/Liveliness items loaded on the Challenge dimension, while a small number loaded across a variety of scales. Therefore, some items were eliminated from the SOQ, and the Challenge dimension was redefined and expanded to include information provided by the additional Dynamism items. This resulted in the renaming of the Challenge dimension to "Challenge and Involvement."

Respondents used a scale ranging from 0 (not at all applicable) to 3 (applicable to a high degree) to indicate the extent to which each statement described their work situation. All items were developed to measure one of the nine dimensions and were randomly ordered.

The SOQ was distributed through the various organizations' mail systems along with a memorandum describing the purpose of the measure. Completed instruments were then returned to the Creative Problem Solving Group for scoring. Steps were taken to ensure voluntary participation and confidentiality. Similar procedures were followed for the web-based assessment.

Results and Discussion

The descriptive statistics and alpha coefficients are presented in Table 72. The climate dimension means range from 105.92 for Idea-Time to 204.62 for Challenge/Involvement. The Cronbach's Alpha coefficient was computed using the items on the theoretical dimensions rather than the loadings that were observed in the exploratory factor analysis because of the similarity in the results. The Cronbach's Alpha coefficient ranged from .62 for Risk-Taking to .90 for Idea-Support, with seven of the nine dimensions yielding alpha coefficients greater than .80.

The Cronbach's Alpha coefficient computed from the exploratory factor analysis was different on the dimensions of Freedom (.76), Idea-Support (.91), Debate (.86) and Risk-Taking (.63). It should be noted that the Risk-Taking and Trust/Openness

dimensions contain the smallest number of items, four and three respectively, which makes achieving a Cronbach's alpha coefficient of .70 or greater even more challenging. Future research will seek to improve the internal consistency of these scales by adding additional items and further testing the reliability of these scales.

Table 72
Means, Standard Deviations, and Cronbach's alpha (n = 1111) for Dimensions of the Situational Outlook Questionnaire®

Dimension	M	SD	Range		
			Min.	Max.	
Challenge/Involvement (7 items)	204.62	54.22	29	300	.84
Freedom (7 items)	152.15	60.20	0	300	.84
Trust/Openness (3 items)	139.15	74.08	0	300	.64
Idea-Time (6 items)	105.92	63.91	0	300	.88
Playfulness/Humor (6 items)	158.16	65.94	0	300	.89
Conflict (6 items)	108.84	70.92	0	300	.86
Idea-Support (5 items)	158.82	67.09	0	300	.90
Debate (6 items)	180.68	58.54	0	300	.88
Risk-Taking (4 items)	117.82	55.41	0	275	.62

Table 73 presents the results of the exploratory factor analysis of the SOQ version 5 items. The presentation of the oblique rotation of the Principal Axis factor analysis extraction was performed on SPSS® for the Macintosh, version 4.0. A loading of .25 was used as the criterion for the oblique rotated solution. Nine dimensions were extracted using an Eigenvalue equal to or greater than 1.0. The majority of items loaded with their theoretical dimension. Three items showed multiple loadings across dimensions; one of these items (item 18) had its highest loading on its respective theoretical dimension. Of the remaining two items (items 49 and 42), they loaded with their theoretical dimensions; however, their highest loading appeared on another factor. This may necessitate the refinement or possible replacement of these items. The nine factors yielded by this analysis accounted for

62.3% of the variance when combined. The lower portion of Table 73 details the percentage of variance accounted for by each dimension and the respective Eigenvalues.

Table 73
Principal Axis Factor Analysis (Oblique Rotation)
SOQ version 5 (n = 1111)

Theoretic Scale	Component								
	1	2	3	4	5	6	7	8	9
Idea-Support	.742								
Idea-Support	.705								
Idea-Support	.638								
Idea-Support	.528								
Idea-Support	.481								
Debate	.369				-.277				
Freedom	.341					-.335			
Conflict		.698							
Conflict		.694							
Conflict		.690							
Conflict		.684							
Conflict		.598							
Conflict		.597							
Challenge/Involvement			.755						
Challenge/Involvement			.650						
Challenge/Involvement			.612						
Challenge/Involvement			.548						
Challenge/Involvement			.512						
Challenge/Involvement			.486						
Challenge/Involvement			.321						-.267
Playfulness/Humor				-.801					
Playfulness/Humor				-.736					
Playfulness/Humor				-.710					
Playfulness/Humor				-.691					
Playfulness/Humor				-.556					
Playfulness/Humor				-.506					
Debate					-.804				
Debate					-.751				
Debate					-.704				
Debate					-.631				
Debate					-.537				
Risk-Taking					-.280				
Freedom						-.645			
Freedom						-.578			
Freedom						-.561			
Freedom						-.483			
Freedom						-.474			
Risk-Taking									

Idea-Time							-.811		
Idea-Time							-.801		
Idea-Time							-.764		
Idea-Time							-.717		
Idea-Time							-.564		
Idea-Time							-.470		
Trust/Openness								.526	
Trust/Openness								.471	
Trust/Openness								.437	
Risk-Taking									-.350
Risk-Taking									-.297
Eigenvalues	16.4	3.3	2.6	2.0	1.6	1.4	1.3	1.1	1.0
% Variance Accounted for by Factors	33.4	6.7	5.2	4.1	3.3	2.8	2.6	2.2	2.0

The results presented evidence that the psychometric properties of the Situational Outlook Questionnaire® version 5 were generally acceptable. A strength of the study was that these results were consistent across groups and contexts. One limitation of the study was that this was not a random sample of organizations or individuals in organizations. A further limitation was the lower number of items used to assess the dimensions of Risk-Taking and Trust/Openness. In this respect, refinements to these dimensions will be initiated to strengthen their internal consistency. Another potential concern is that the measurement scales do not have a sufficient range of possible scores. Increasing the scale increments will be an issue for further inquiry.

This study has provided preliminary psychometric evidence of the SOQ version 5's internal structure. It was at this stage of development that new efforts were initiated to explore other forms of the measure's validity in addition to providing further evidence of its construct validity. Future investigations need to compare the Situational Outlook Questionnaire® to other established measures of organizational climate and environment, such as KEYS (Amabile et al., 1996). Turnipseed (1994) has already begun this process by comparing this measure to the Work Environment Scale. Other studies need to investigate the Situational Outlook Questionnaire's relationship to other important organizational variables, such as Talbot, Cooper, and Barrow's (1992) study of the relationship between the climate for creativity and job-related stress. Another important line of research should focus on the relationship of the climate for creativity and change to personality variables, such as Isaksen and

Kaufmann's (1990) investigation of the relationship of the Situational Outlook Questionnaire® to the Kirton Adaption-Innovation Inventory. These types of studies will assist in the further understanding of the Situational Outlook Questionnaire® and the construct of climate for creativity and change. The following chapter will report the status of these efforts in more detail.

SOQ Version 6 (2001)

Version 6 of the SOQ was developed in 2001, following a review of the item distributions, scale reliabilities and factor structure of SOQ version 5. The Risk-Taking and Trust/Openness scales were key targets for improvement, so some items were carefully edited and other new items added.

The sample for this version of the SOQ included 4,730 individuals. It was composed of individuals from a variety of programs and services provided by the Creative Problem Solving Group. For this study, data from an aggregated set of samples of convenience was collected from September of 2002, through February of 2006. Twenty-seven organizations were included with samples ranging from 1169 individuals involved in a leadership development program within a global enterprise software provider, another 1052 individuals from a North American division of a global financial services and accounting firm, to a sample of five individuals from a small plastics manufacturing firm. For the 2646 individuals who indicated their gender, 1628 were males and 1018 were females. The ages ranged from 17 to 69, with an average of 37.96 for the 2864 who reported this data. All participants took the SOQ in English via the web. Fifty-four percent of the sample came from outside North America and included respondents from the UK, Germany, Italy, France, Netherlands, Belgium, and Denmark.

Table 74 illustrates the item means and standard deviations for version 6 of the SOQ.

Table 74
SOQ Item Norms: Means and Standard Deviations

Overall SOQ Item	Mean	Std. Dev.	n
2	206	76.3	4730
3	144	81.2	4728
4	126	91.0	4729
5	205	72.8	4730
6	181	78.6	4730
7	208	74.0	4730
8	83	84.0	4730
9	190	74.3	4729
10	187	74.4	4730
11	237	67.8	4730
12	141	87.4	4730
13	170	73.0	4729
14	187	73.6	4730
15	172	75.9	4728
16	211	76.0	4730
17	182	76.4	4727
18	168	81.8	4729
19	126	77.6	4730
20	187	79.9	4729
21	182	72.6	4730
22	161	75.3	4730
23	221	70.0	4728
24	56	76.8	4728
25	124	75.6	4729
26	177	71.6	4730
27	228	70.9	4730
28	137	74.6	4730
29	127	86.3	4730
30	91	89.9	4729
31	181	72.5	4729
32	133	78.9	4729
33	191	74.7	4730
34	130	88.6	4730
35	120	73.1	4729
36	175	82.6	4730
37	176	75.8	4729
38	189	71.2	4730
39	233	66.5	4730
40	149	78.1	4729
41	152	72.3	4729
42	161	76.7	4729
43	150	86.5	4730
44	117	99.6	4730
45	169	73.7	4729
46	70	79.8	4729
47	169	75.9	4729

48	146	97.1	4730
49	199	71.1	4730
50	130	72.1	4730
51	196	72.0	4730
52	153	73.6	4730
53	231	70.3	4730

Table 75 presents the scale means and standard deviations for the entire sample (n=4730). This table also presents the Standard Error of Measurement (sem) for each of the nine dimensions of the SOQ. This was calculated by multiplying the standard deviation by the square root of one, minus the reliability coefficients for each dimension. The reliability coefficients were taken from Table 76 through Table 85. Thus, given an observed score for Challenge/Involvement, there is a 68.26% probability that the person's true score would be that score ±20.2.

Table 75
SOQ Scale Norms: Means, Standard Deviations, and Standard Error

Dimension	Mean	Std. Dev.	sem	n
Challenge/Involvement	215.07	53.93	20.18	4730
Freedom	170.69	56.31	23.22	4730
Trust/Openness	174.47	54.24	29.71	4730
Idea-Time	132.83	60.29	22.74	4730
Playfulness/Humor	169.27	63.75	22.78	4730
Conflict	90.38	66.45	24.86	4730
Idea-Support	179.83	61.97	20.55	4730
Debate	190.63	57.57	19.94	4730
Risk-Taking	146.65	55.69	25.52	4730

Comparing version 6 with version 5, the means for all dimensions of version 6, except Idea-Support, are higher. The largest difference in standard deviations is on the Trust/Openness dimension. For version 5 it was 74.08, and for version 6 it is 54.24.

Distribution and Performance of Items

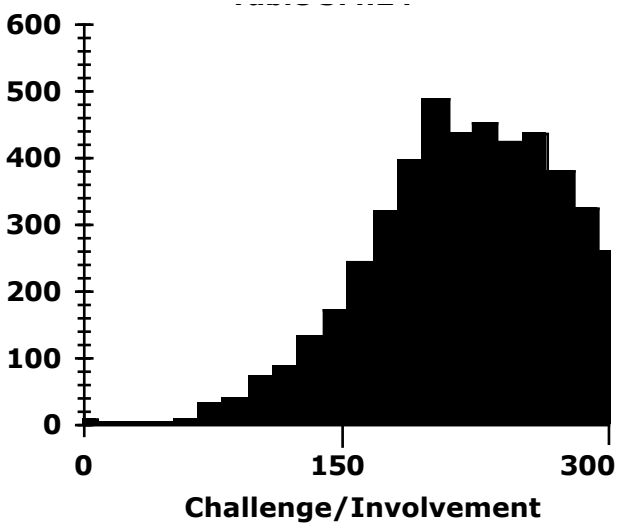
The purpose of this section is to describe the distribution results of the SOQ version 6's dimensions and item performance. The intent is to determine to what extent do the responses on the items illustrate acceptable levels of discrimination and relationship to their assigned scale. Such information is useful for solving a variety of problems in inferential statistics (Jaeger, 1990) e.g., eliminating items that caused overly skewed results. These results will be presented and interpretations will be discussed.

Table 76
SOQ V 6 Internal Reliability: Some Items Removed

Dimension	Cronbach's Alpha
Challenge/Involvement	.78
Freedom	.78
Trust/Openness	.79
Idea-Time	.78
Playfulness/Humor	.78
Conflict	.90
Idea-Support	.76
Debate	.77
Risk-Taking	.77

The results of Cronbach's Alpha for the SOQ version 6 are presented in Table 76. General improvement on the Trust/Openness and Risk-Taking scales was found. More detail on the distribution of items as well as item to scale correlation and internal consistency of the scales follows.

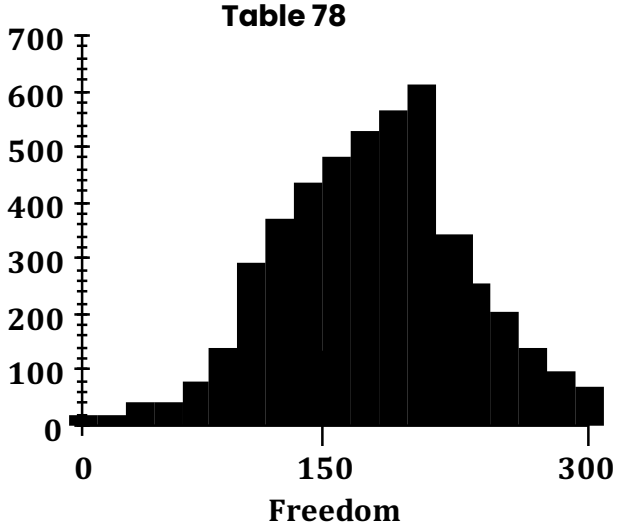
Table 77



Mean 215.07 Median 214.29
Mode 200 Std. Dev. 53.92

Table 77 presents the frequency distribution for the scores on the Challenge/Involvement scale. This scale has a negative skew indicating that for the samples of convenience used for this analysis, more respondents are choosing higher scores on this dimension. The central tendency results include a mean of 215, median of 214.3, and a mode of 200. This dimension has a standard deviation of 54.

Table 78

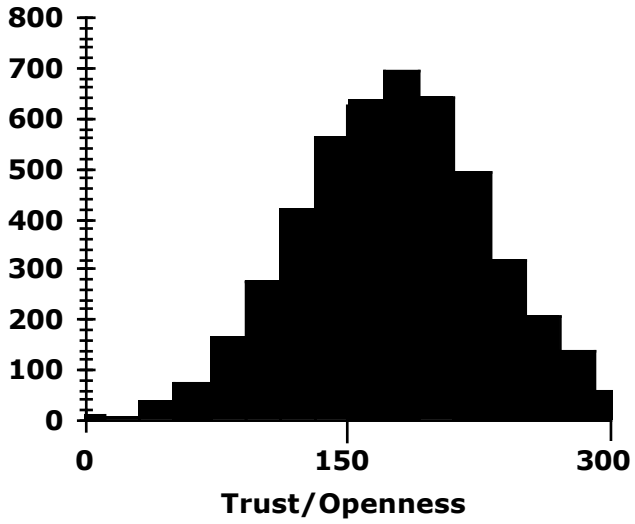


Mean 170.69 Median 166.67
Mode 200 Std. Dev. 56.31

Table 78 presents the frequency distribution for the scores on the Freedom dimension of SOQ version 6. The results indicate a leptokurtic distribution with a negative skew. The central tendency results include a mean of 170.7, median of 166.7, and a mode of 200. This dimension has a standard deviation of 56.3.

Table 79 presents the frequency distribution for the scores on the Trust/Openness dimension of the SOQ version 6. The results indicate a leptokurtic distribution with a negative skew. The central tendency results indicate a mean of 174.5, median of 180, and a mode of 180. This dimension has a standard deviation of 54.2.

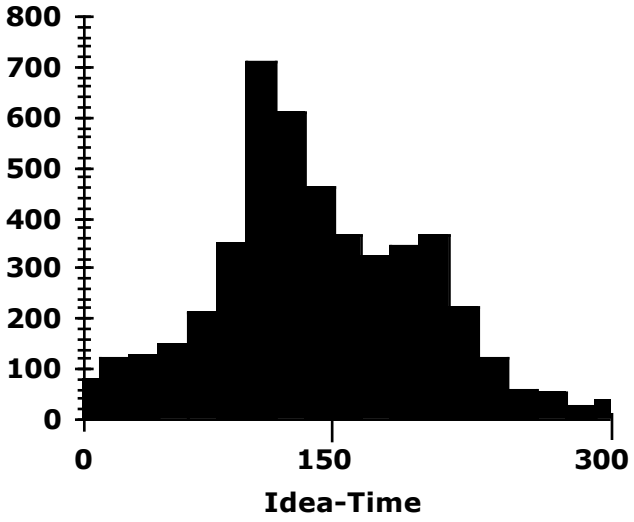
Table 79



Mean	174.47	Median	180
Mode	180	Std. Dev.	54.24

Table 80 presents the frequency distribution for the scores on the Idea-Time dimension of the SOQ version 6. The results indicate a more mesokurtic distribution with a slight positive skew. This suggests that most respondents are scoring lower on this dimension. The central tendency results indicate a mean of 132.8, median of 133.3, and a mode of 100. This dimension has a standard deviation of 60.3.

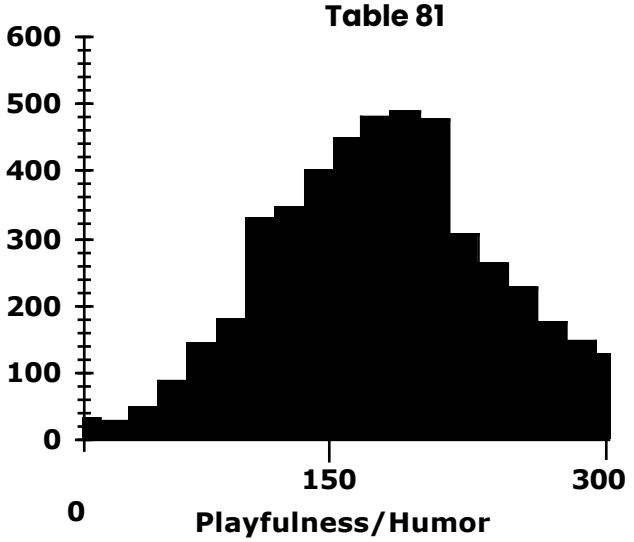
Table 80



Mean	132.83	Median	133.33
Mode	100	Std. Dev.	60.29

Table 81 presents the frequency distribution for the scores on the Playfulness/Humor dimension of the SOQ version 6. The results indicate a mesokurtic distribution with a slight negative skew and uneven tails. The central tendency results indicate a mean of 169.3, median of 166.7, and a mode of 183.3. This dimension has a standard deviation of 63.8.

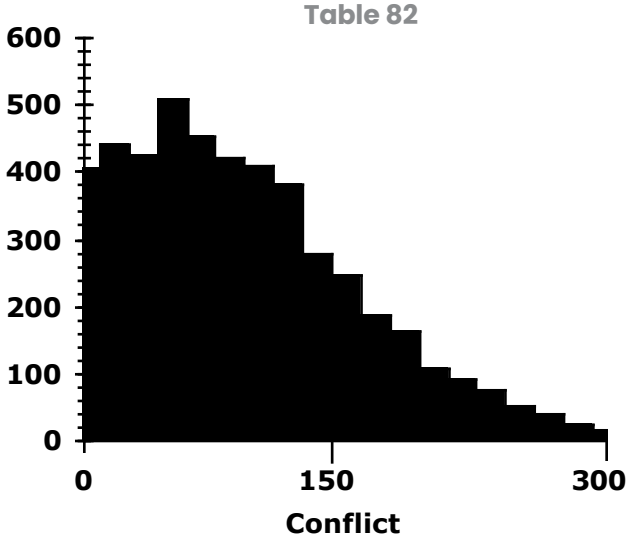
Table 81



Mean	169.27	Median	166.67
Mode	183.33	Std. Dev.	63.75

Table 82 presents the frequency distribution for the scores on the Conflict dimension of the SOQ version 6. Remember that the Conflict dimension is one that has a negative connotation in comparison to the other eight dimensions of the SOQ. The results indicate distribution with a clear positive skew and uneven tails.The central tendency results indicate a mean of 90.4, median of 83.3, and a mode of 50. This dimension has a standard deviation of 66.5. These results indicate that most respondents are providing lower scores on the items within this dimension, particularly relative to the other eight dimensions.

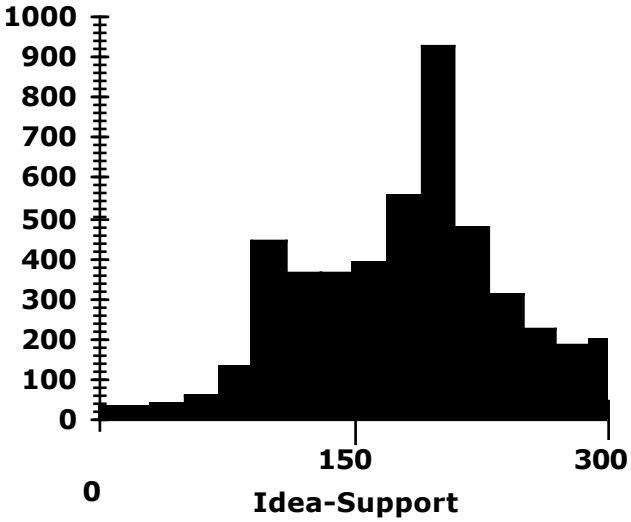
Table 82



Mean	90.38	Median	83.33
Mode	50	Std. Dev.	66.45

Table 83 presents the frequency distribution for the scores on the Idea-Support dimension of the SOQ version 6. The results indicate a mesokurtic distribution with a slight negative skew and uneven tails. The central tendency results indicate a mean of 179.8, median of 180, and a mode of 200. This dimension has a standard deviation of 62.

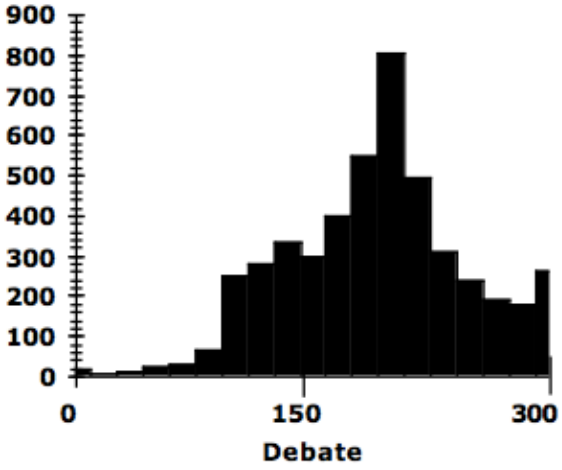
Table 83



Mean	179.83	Median	180
Mode	200	Std. Dev.	61.97

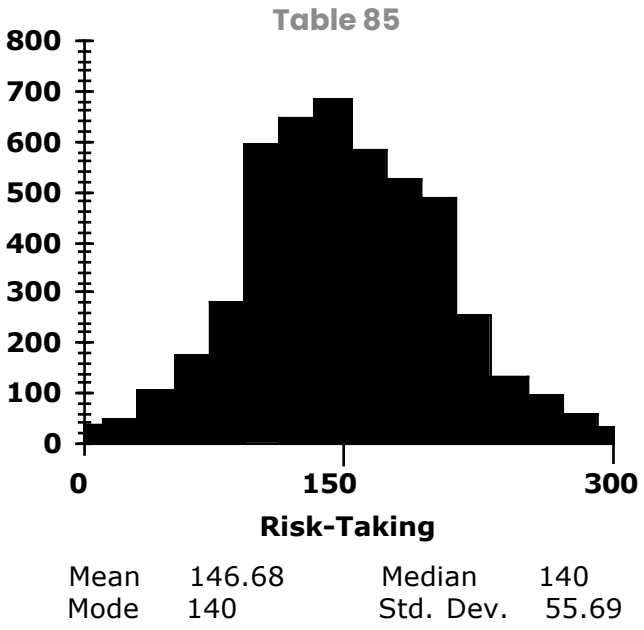
Table 84 presents the frequency distribution for the scores on the Debate dimension of the SOQ version 6. The results indicate a mesokurtic distribution with a slight negative skew and uneven tails. The central tendency results indicate a mean of 190.6, median of 200, and a mode of 200. This dimension has a standard deviation of 57.6.

Table 84



Mean	190.63	Median	200
Mode	200	Std. Dev.	57.57

Table 85 presents the frequency distribution for the scores on the Risk-Taking dimension of the SOQ version 6. The results indicate a slightly leptokurtic distribution with a very slight positive skew. The central tendency results indicate a mean of 146.7, median of 140, and a mode of 140. This dimension has a standard deviation of 55.7.



The frequency distributions for the scores on the dimensions of the SOQ version 6 do not reflect purely mesokurtic shapes and are often positively or negatively skewed. The results are derived from samples of convenience, rather than from a completely random sampling approach, so they are not surprising. They do, however, indicate that care must be taken with many statistical tests requiring the conformance with the assumption of a normal distribution.

Inter-item Correlations

The following tables report the correlations among items for all nine dimensions of the SOQ version 6. For example, Table 86 presents the correlations among all items for the Challenge/Involvement scale of the SOQ version 6. The table also reports a Cronbach's Alpha of .86 for this dimension.

Table 86
Correlations among SOQ Challenge/Involvement Items for Overall Sample (n = 4730) α= .8619

Challenge/ Involvement Items	1	2	3	4	5	6	7
1	1.00						
2	.47	1.00					
3	.47	.53	1.00				
4	.57	.47	.50	1.00			
5	.34	.46	.43	.36	1.00		
6	.42	.50	.46	.44	.44	1.00	
7	.46	.57	.62	.46	.50	.51	1.00

All correlations are significant at p < .01 level

Table 87 presents the correlations among all items for the Freedom scale of the SOQ version 6. The table also reports a Cronbach's Alpha of .83 for this dimension.

Table 87
Correlations among SOQ Freedom Items for Overall Sample (n = 4730) α= .8296

Freedom Items	1	2	3	4	5	6
1	1.00					
2	.56	1.00				
3	.46	.48	1.00			
4	.42	.46	.41	1.00		
5	.49	.49	.47	.43	1.00	
6	.39	.42	.45	.36	.44	1.00

All correlations are significant at p < .01 level

Table 88 presents the correlations among all items for the Trust/Openness scale of the SOQ version 6. The table also reports a Cronbach's alpha of .69 for this dimension. This represents a slight improvement on the internal reliability of this scale as the alpha for version 5 of the SOQ was .64. The current alpha is very close to the standard of .70. Additional work on this dimension's items will be required.

Table 88
Correlations among SOQ Trust/Openness Items
for Overall Sample (n = 4730) α= .6919

Trust/Openness Items	1	2	3	4	5
1	1.00				
2	.17	1.00			
3	.42	.20	1.00		
4	.39	.36	.39	1.00	
5	.26	.29	.24	.46	1.00

All correlations are significant at p < .01 level

Table 89 presents the correlations among all items for the Idea-Time scale of the SOQ version 6. The table also reports a Cronbach's alpha of .86 for this dimension.

Table 89
Correlations among SOQ Idea-Time Items
for Overall Sample (n = 4730) α= .8666

Idea-Time Items	1	2	3	4	5	6
1	1.00					
2	.38	1.00				
3	.55	.45	1.00			
4	.44	.43	.61	1.00		
5	.51	.42	.63	.60	1.00	
6	.48	.44	.64	.70	.66	1.00

All correlations are significant at p < .01 level

Table 90 presents the correlations among all items for the Playfulness/Humor scale of the SOQ version 6. The table also reports a Cronbach's alpha of .88 for this dimension.

Table 90
Correlations among SOQ Playfulness/Humor Items for Overall Sample (n = 4730) α= .8808

Playfulness/ Humor Items	1	2	3	4	5	6
1	1.00					
2	.53	1.00				
3	.68	.56	1.00			
4	.50	.54	.59	1.00		
5	.58	.47	.65	.57	1.00	
6	.48	.51	.53	.62	.50	1.00

All correlations are significant at p < .01 level

Table 91 presents the correlations among all items for the Conflict scale of the SOQ version 6. The table also reports a Cronbach's alpha of .86 for this dimension.

Table 91
Correlations among SOQ Conflict Items for Overall Sample (n = 4730) α= .8556

Conflict Items	1	2	3	4	5	6
1	1.00					
2	.45	1.00				
3	.44	.53	1.00			
4	.51	.48	.52	1.00		
5	.49	.46	.55	.58	1.00	
6	.41	.49	.59	.48	.55	1.00

All correlations are significant at p < .01 level

Table 92 presents the correlations among all items for the Idea-Support scale of the SOQ version 6. The table also reports a Cronbach's alpha of .89 for this dimension.

Table 92
Correlations among SOQ Idea-Support Items for Overall Sample (n = 4730) α= .8912

Idea-Support Items	1	2	3	4	5
1	1.00				
2	.68	1.00			
3	.57	.62	1.00		
4	.63	.67	.60	1.00	
5	.59	.62	.58	.66	1.00

All correlations are significant at p < .01 level

Table 93 presents the correlations among all items for the Debate scale of the SOQ version 6. The table also reports a Cronbach's alpha of .88 for this dimension.

Table 93
Correlations among SOQ Debate Items for Overall Sample (n = 4730) α= .8833

Debate Items	1	2	3	4	5	6
1	1.00					
2	.52	1.00				
3	.51	.61	1.00			
4	.58	.57	.63	1.00		
5	.57	.57	.64	.67	1.00	
6	.48	.43	.46	.54	.60	1.00

All correlations are significant at p < .01 level

Table 94 presents the correlations among all items for the Risk-Taking scale of the SOQ version 6. The table also reports a Cronbach's alpha of .79 for this dimension. This represents a large improvement on this dimension's internal consistency as the Cronbach's alpha for Risk-Taking on version 5 was .62.

Table 94
Correlations among SOQ Risk-Taking Items
for Overall Sample (n = 4730) α= .7934

Risk-Taking Items	1	2	3	4	5
1	1.00				
2	.47	1.00			
3	.33	.44	1.00		
4	.41	.49	.45	1.00	
5	.44	.50	.41	.43	1.00

All correlations are significant at p < .01 level

The general results on the item and item-to-scale performance represents a general trend towards improvement on the psychometrics for the Risk-Taking scale without negative effects on the other scales. Further refinement will be required for the Trust/Openness dimension.

Inter-Dimension Correlations

The purpose of this section is to describe the results from the correlation analysis of the SOQ's dimensions and items. Table 95 shows the correlations among the dimensions for the entire sample (n=4730). The level of significance for each correlation was very strong, at p<.01. The results showed that the dimensions had positive relationships to each other. For example, the Challenge/Involvement dimension is strongly correlated to Idea-Support, Trust/Openness, and Risk-Taking. Risk-Taking and Idea-Support also show strong inter-relationships.

Table 95
Inter-Correlations Between Dimensions of the SOQ
(n = 4730)

Dimension	1	2	3	4	5	6	7	8	9
Challenge/Involvement	1.00								
Freedom	.502	1.00							
Trust/Openness	.602	.411	1.00						
Idea-Time	.456	.530	.391	1.00					
Playfulness/Humor	.511	.441	.519	.475	1.00				
Conflict	-.363	-.165	-.484	-.186	-.318	1.00			
Idea-Support	.648	.544	.593	.607	.585	-.401	1.00		
Debate	.515	.475	.475	.461	.493	-.209	.691	1.00	
Risk-Taking	.527	.591	.471	.572	.493	-.168	.668	.602	1.00

All correlation are significant at $p < .01$ level

Gender Differences

Lauer and Isaksen (2001) reported a number of significant differences in sub-climates using the SOQ. One of the most meaningful results from this study was the occurrence of differences in climate scores for males and females. The published study used data from approximately 1,000 individuals, so further analysis was conducted using the current data available for SOQ version 6.

Table 96
Descriptive Statistics – Female

Dimension	N	Minimum	Maximum	Mean	Std. Deviation
Challenge/Involvement	933	14	300	214.50	52.08
Freedom	933	0	300	172.58	55.02
Trust/Openness	933	20	300	173.74	53.77
Idea-Time	933	0	300	127.33	58.04
Playfulness/Humor	933	0	300	175.17	62.83
Conflict	933	0	300	90.03	69.65
Idea-Support	933	0	300	181.29	60.66
Debate	933	0	300	191.21	58.04
Risk-Taking	933	0	300	144.84	55.31

The descriptive statistics for those who reported their gender as female are included in Table 96. Of the total sample of 4730, 2248 individuals did not report their gender. Of the 2482 who did report their gender, 933 were females and 1549 were males.

The descriptive statistics for those who reported their gender as male are included in Table 97 below.

Table 97
Descriptive Statistics - Male

Dimension	N	Minimum	Maximum	Mean	Std. Deviation
Challenge/Involvement	1549	0	300	202.19	56.07
Freedom	1549	0	300	160.14	56.18
Trust/Openness	1549	0	300	161.15	55.05
Idea-Time	1549	0	300	122.47	55.73
Playfulness/Humor	1549	0	300	155.69	61.83
Conflict	1549	0	300	97.22	66.80
Idea-Support	1549	0	300	164.61	61.64
Debate	1549	0	300	181.64	58.22
Risk-Taking	1549	0	300	135.21	53.73

An Analysis of Variance was conducted to test the significance of the difference between the means for males and females. These results are reported in Table 98 below.

Table 98
ANOVA on Differences in Gender

Dimension	df	F	Sig.
Challenge/Involvement	2481	29.566	.000
Freedom	2481	29.015	.000
Trust/Openness	2481	30.998	.000
Idea-Time	2481	4.300	.038
Playfulness/Humor	2481	57.086	.000
Conflict	2481	6.535	.011
Idea-Support	2481	43.134	.000
Debate	2481	15.761	.000
Risk-Taking	2481	18.311	.000

It appears that there are significant differences in the way males and females view their climate. Females have significantly more positive scores on all nine dimensions of the SOQ version 6. To some extent, the level of significance may be influenced by the relatively large sample size. When comparing the actual means for each gender, the actual differences are relatively small. For example, the actual difference in the means for Risk-Taking is 9.6 points (on a theoretic scale of 300 points). Whatever the case, those who use the SOQ will need to carefully consider the gender differences that may exist within certain organizations and levels of analysis.

Age Differences

Lauer & Isaksen (2001) noted that for some organizations, there were significant differences on climate scores based on age. For the existing sample, 2863 individuals provided their age when they took the SOQ version 6. Table 99 shows the correlation results for climate dimension scores and age. All but two dimensions show a

significant correlation with age. These significance levels could be due to the size of the sample, as the *r* values are rather small.

Table 99
Correlation SOQ Dimensions & Age (n = 2863)

Dimension	Pearson Correlation	Sig.
Challenge/Involvement	.161	.000
Freedom	.071	.000
Trust/Openness	.134	.000
Idea-Time	.024	.102
Playfulness/Humor	-.027	.078
Conflict	-.081	.000
Idea-Support	.078	.000
Debate	.085	.000
Risk-Taking	.060	.001

The next step to examine age differences was to place the respondent into one of nine, five-year intervals. Table 100 presents the correlation results for each interval.

Table 100
Correlation SOQ Dimensions & Age Ranges

		Age 17-24 n = 128	Age 25-29 n = 356	Age 30-34 n = 549	Age 35-39 n = 650	Age 40-44 n = 575	Age 45-49 n = 321	Age 50-54 n = 164	Age 55-59 n = 96	Age 60+ n = 24
Challenge/ Involvement	Pearson Correlation	.032	.075	.010	.122**	-.021	.014	.039	.006	.041
	Sig.	.721	.156	.818	.002	.615	.806	.619	.955	.850
Freedom	Pearson Correlation	.009	-.027	-.009	.004	-.044	-.101	.041	.062	.286
	Sig.	.924	.613	.834	.918	.287	.071	.598	.547	.176
Trust/ Openness	Pearson Correlation	.048	.032	.036	.155**	-.005	-.008	.052	.126	-.121
	Sig.	.589	.552	.400	.000	.897	.890	.509	.221	.573
Idea-Time	Pearson Correlation	.117	-.019	-.051	.111**	.036	-.084	-.009	.012	-.034
	Sig.	.189	.725	.235	.005	.393	.133	.907	.909	.874
Playfulness/ Humor	Pearson Correlation	-.095	-.010	-.042	.060	.007	-.023	-.037	.027	-.043
	Sig.	.288	.857	.326	.127	.874	.676	.635	.792	.840
Conflict	Pearson Correlation	.038	-.071	-.016	-.090*	-.002	-.027	-.094	-.075	.238
	Sig.	.672	.183	.716	.022	.970	.634	.233	.469	.262
Idea-Support	Pearson Correlation	.018	-.048	-.026	.037	.039	-.004	.104	.096	-.055
	Sig.	.843	.370	.542	.343	.350	.946	.185	.352	.798
Debate	Pearson Correlation	.072	-.008	.011	.041	.004	.107	.039	-.056	.131
	Sig.	.421	.880	.793	.302	.917	.056	.622	.586	.542
Risk-Taking	Pearson Correlation	.084	-.113*	-.031	.022	-.050	-.009	-.044	-.023	.011
	Sig.	.345	.032	.465	.583	.233	.879	.580	.823	.960

**. Correlation is significant at p < .01 level (2-tailed).

*. Correlation is significant at p < .05 level (2-tailed).

The results from the analysis of the relationship between these age intervals and each of the nine dimensions of climate show generally negligible correlations, yet one age group (35-39) has four significant relationships. Another age group (25-29) shows only one significant relationship. In general, the low r values indicate a very slight relationship between scores on the SOQ version 6 and age. Again, these data do indicate that those who use the SOQ may wish to look at age and the amount of time within the organization as other factors to consider when interpreting results.

Table 101
ANOVA on Differences in Age Intervals

	df	F	Sig.
Challenge/Involvement	8	11.440	.000
Freedom	8	4.476	.000
Trust/Openness	8	8.355	.000
Idea-Time	8	4.254	.000
Playfulness/Humor	8	1.136	.335
Conflict	8	3.620	.000
Idea-Support	8	3.836	.000
Debate	8	5.330	.000
Risk-Taking	8	3.930	.000

A final level of analysis for exploring age differences was to conduct an Analysis of Variance using the age intervals to see if we could find significant differences among the intervals (see Table 101). Again, significant differences were found among the age intervals identified above. To some extent, these may be due to the large sample size.

Stability of Forms: Comparison of On-Line and Paper Edition

This study was designed to examine the relationship between the web assessment of the SOQ and the paper version.

Purpose and sample. The complete data set combines results from both the print and web edition of the SOQ. A sample of convenience of 19 subjects who have responded to both the printed and the web form was assembled. The age range for the total sample was 18 to 35 with 2 people withholding their age. Of the participants that stated their age the average was 25.71, 84.2% of the 19 participants were male and 15.8% were female. Educational status was 15.8% with a High School diploma, 42.1% with some College, 26.3% with a Bachelors Degree and 15.8% with some Graduate school. The amount of time in the same company was almost evenly distributed over the five intervals, being 0-6 months: 21.1%, 6-12 months: 21.1%, 1-2 years: 26.3%, 2-5 years: 15.8%, 5-10 years: 15.8%. People that were in their current position for 5 years or less accounted for 84.2% of the total sample.

Results. The means, standard deviations and correlation coefficients of the on-line edition compared to the paper edition are presented in Table 102.

The results indicate that both forms yielded highly comparable results. The means and standard deviations across web and paper version are similar and consistent on all nine dimensions. Keeping in mind that the SOQ is an interpersonal measure, we see a strong Pearson correlation between both editions. Each of these correlations is significantly different from zero ($p \leq .001$). The overall correlation was .92.

Table 102
SOQ Comparison between On-line and Paper Editions
(n=19, Overall Correlation = .92)

Dimensions	On-Line Edition		Paper Edition		Correlation	
	Mean	SD	Mean	SD	Pearson	Sig.
Challenge/Involvement	244	43.77	238	44.43	.841	.000
Freedom	166	41.38	147	47.55	.728	.000
Trust/Openness	202	56.92	211	58.39	.889	.000
Idea-Time	147	52.78	145	44.81	.836	.000
Playfulness/Humor	227	47.54	231	43.48	.738	.000
Conflict	46	44.04	37	47.00	.873	.000
Idea-Support	204	55.61	196	56.01	.798	.000
Debate	212	56.06	201	50.76	.717	.001
Risk-Taking	176	46.94	170	53.23	.925	.000

To determine if the differences between the web and the paper version were significantly different from each other, we performed an Analysis of Variance. The results are presented in Table 103. The results indicate that the means are not significantly different.

Table 103
SOQ Comparison between On-line and Paper Editions: ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Challenge/Involvement	Between Groups	263.16	1	263.16	.135	.715
	Within Groups	70010.74	36	1944.74		
	Total	70273.90	37			
Freedom	Between Groups	3223.68	1	3223.68	1.623	.211
	Within Groups	71520.47	36	1986.68		
	Total	74744.15	37			
Trust/Openness	Between Groups	760.53	1	760.53	.229	.635
	Within Groups	119694.74	36	3324.85		
	Total	120455.26	37			
Idea-Time	Between Groups	65.79	1	65.79	.027	.869
	Within Groups	86286.55	36	2396.85		
	Total	86352.34	37			
Playfulness/Humor	Between Groups	116.96	1	116.96	.056	.814
	Within Groups	74707.60	36	2075.21		
	Total	74824.56	37			
Conflict	Between Groups	730.99	1	730.99	.352	.556
	Within Groups	74678.36	36	2074.40		
	Total	75409.36	37			
Idea-Support	Between Groups	673.68	1	673.68	.216	.645
	Within Groups	112126.32	36	3114.62		
	Total	112800.00	37			
Debate	Between Groups	1235.38	1	1235.38	.432	.515
	Within Groups	102953.22	36	2859.81		
	Total	104188.60	37			
Risk-Taking	Between Groups	318.42	1	318.42	.126	.724
	Within Groups	90663.16	36	2518.42		
	Total	90981.58	37			

The preceding results provide evidence of solid correlations between the web and paper version. Keeping in mind that the SOQ is an interpersonal measure, the means and standard deviations give a first good overall impression of stability. The overall correlation of .92 and the non-significant differences between the means of each

dimension provide reasonable evidence regarding the stability of performance across formats of the SOQ.

Evidence of Stability over Time

Purpose and sample. This study was designed to examine the stability of the SOQ over a seven-month time interval. The context for the data-collection was a leadership development program for a large global organization. The organization involved in this course and this study is a global leader in collaborative business software, with more than 39,000 customers, and offices located in over 65 countries. The organization had contracted with a well-known leadership development center to provide a series of workshops to help strengthen their leading and managing skills. The sample included four different groups of participants involved in a leadership development program. Each workshop included about 18-20 participants. Each participant was instructed to invite 8-10 observers of their behavior to complete the SOQ as well.

The data was collected during March 2004, July 2004, August 2004, and October 2004 for a combined total of 798 subjects. The age range for the total sample was 23 to 62 with 218 people withholding their age. Of the participants that stated their age the average was 40. Of the 798 participants 449 chose to disclose their gender, the breakdown was 28.3% female and 71.7% male. Educational status was 1.00% with a High School diploma, 5.76% with some College, 35.09% with a Bachelors Degree, 14.54% with some Graduate school, 36.09% with a Masters Degree, and 7.53% with a Doctorate. The current employer had employed almost 62% of the total sample for over five years, and more than 53% were in their current position for longer than two years.

Results. Observation of the means for the four groups on each dimension, as presented in Table 104, indicated that the scores on all the SOQ dimensions are very close over time. The low standard deviations show a rather tight dispersion regarding how the individuals see their organizational climate.

Table 104
Descriptive Results

Dimensions	A n=228		B n=184		C n=196		D n=190	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Challenge/Involvement	220	55.03	224	50.27	221	51.12	220	47.95
Freedom	190	53.80	185	51.43	186	51.09	182	55.59
Trust/Openness	171	53.66	181	51.23	176	55.27	173	50.19
Idea-Time	132	59.20	138	56.79	137	56.92	130	61.99
Playfulness/Humor	167	64.16	173	59.78	172	62.35	167	60.86
Conflict	99	64.19	94	67.36	96	65.36	104	66.00
Idea-Support	186	58.47	186	58.22	182	56.09	181	63.01
Debate	199	54.37	200	51.04	196	55.73	198	57.58
Risk-Taking	161	56.47	162	54.41	160	54.04	156	55.89

Table 105 shows that all four samples have an internal consistency that is generally accepted for this type of measurement (above .70). Internal consistency was calculated on the individual level, as this is a prerequisite of reliability on the aggregated level (i.e. group or organization). Although each sample included different participants and observers, the SOQ seemed to perform in a similar manner across all four samples. The observed differences among the means are all well within the standard error of measure for the SOQ.

Most of the previous investigation into the internal consistency of the SOQ has focused on broadly aggregated samples of convenience, including many different organizational contexts. This study examined samples within one organization, instead of a combination of numerous samples of convenience, implying that people were looking at the same organizational climate rather than a compilation of different climates.

This situation is consistent with the objectivistic approach to climate assessment (Ekvall, 1987). According to this view, climate exists as a reality within the organization and it can be studied and observed in a variety of ways. Climate is seen as an attribute of the organization, independently of the members' perceptions

and is seen as an objective part of the organization's reality. The opposing view is that climate is regarded as a perceptual and cognitive structuring of the situation, common to the organization's members. Both approaches consider climate to be a molar variable, and often take common approaches to empirical assessment. This stability study provided the possibility to examine the extent to which climate, as assessed by the SOQ, was in fact, a molar and objective attribute of the organization. Climate assessment starts with individual psychological perceptions (psychological climate) and then aggregates these to provide a social-psychological assessment. For this study, different individuals were included in each of the samples, and different numbers of participants were included for each. This precluded the standard examination of stability through reliability coefficients.

Table 105
Cronbach's alpha for four samples

	A Overall ☒: .82	B Overall ☒: .82	C Overall ☒: .80	D Overall ☒: .82
Challenge/Involvement	.79	.78	.77	.78
Freedom	.79	.78	.77	.78
Trust/Openness	.79	.79	.76	.79
Idea-Time	.79	.79	.78	.79
Playfulness/Humor	.78	.77	.76	.78
Conflict	.90	.90	.90	.90
Idea-Support	.76	.77	.74	.76
Debate	.78	.77	.75	.77
Risk-Taking	.77	.76	.75	.77

To determine if the differences in the means were statistically significant among the four samples, a multivariate analysis of variance (MANOVA) was conducted. The MANOVA results were not significant [Wilks' Lambda = .974, $F(27,2296) = .775$, $p = .789$], providing initial support for a lack of interaction between climate assessments and time. This analysis was followed by conducting an analysis of variance (ANOVA's) for the nine dimensions to determine the strength and statistical significance of the differences among all four samples on each dimension. The

subsequent ANOVA's (See Table 106) showed that this effect was not statistically significant for all dimensions. The F-values for all dimensions were very low, resulting in significance levels being substantially higher than the .05 cut off. The magnitude of the effect sizes as measured via R2, were substantially lower than .26 and may be considered very small (Cohen, 1977)

Table 106
ANOVA Results

		Sum of Squares	df	Mean Square	F	Sig.
Challenge/Involvement	Between Groups	2643.05	3	881.02	.334	.801
	Within Groups	2093924.14	794	2637.18		
	Total	2096567.18	797			
Freedom	Between Groups	7576.72	3	2525.57	.898	.442
	Within Groups	2233928.78	794	2813.51		
	Total	2241505.50	797			
Trust/Openness	Between Groups	10610.82	3	3536.94	1.273	.282
	Within Groups	2205738.05	794	2778.01		
	Total	2216348.87	797			
Idea-Time	Between Groups	9308.29	3	3102.76	.898	.442
	Within Groups	2743778.59	794	3455.64		
	Total	2753086.88	797			
Playfulness/Humor	Between Groups	7028.99	3	2343.00	.611	.608
	Within Groups	3046328.36	794	3836.69		
	Total	3053357.35	797			
Conflict	Between Groups	9400.92	3	3133.64	.727	.536
	Within Groups	3422037.75	794	4309.87		
	Total	3431438.67	797			
Idea-Support	Between Groups	4724.41	3	1574.80	.453	.715
	Within Groups	2760246.52	794	3476.38		
	Total	2764970.93	797			
Debate	Between Groups	1501.02	3	500.34	.167	.919
	Within Groups	2380030.93	794	2997.52		
	Total	2381531.95	797			
Risk-Taking	Between Groups	4235.89	3	1411.96	.462	.709
	Within Groups	2425619.25	794	3054.94		
	Total	2429855.14	797			

Wilks' Lambda = .974, F(27,2296) = .775, p = .789

The results provide evidence that there are no significant differences among the four samples. The means on all the dimensions for all four samples are very close, and well within SEM. The standard deviations are, for a theoretical range of 0-300, rather low and consistent throughout all samples. The Cronbach's Alphas show acceptable levels of internal consistency across all four samples.

These results indicate that the dimensions assessed by the SOQ are relatively stable over time. Further, the climate these individuals assessed seemed to be consistent despite the fact that different respondents completed the assessments over the seven-month time frame.

In addition to providing evidence for the SOQ's stability over time, this study also provided some support for the ontological distinction made by those who see climate as an objective part of the organization.

Validity

The validity of any measure is a journey, rather than a destination. This chapter will summarize the work done to date in order to document and examine the validity of the Situational Outlook Questionnaire® (SOQ). This chapter will focus on the evidence regarding the SOQ version 6, and the current version, SOQ version 7. The reliability and validity evidence for the Scandinavian precursor and earlier versions are summarized elsewhere in this manual.

Evidence based on Internal Structure

Previous factor analyses of the SOQ used a variety of extraction and rotation methods. Russell (2002) reviewed the use and abuse of factor analysis and concluded that both principal components analysis and principal axis factoring yield somewhat similar results. He indicated that an oblique rotation, such as Promax, allows the rotated factors to be correlated with each other. Since it is clear that the SOQ dimensions are inter-correlated, we selected the Promax method of extraction for the factor analysis of SOQ version 6. Since the nine dimensions are theoretically derived, the analysis was restricted to identify nine factors rather than relying on a

Scree test or applying an automatic cut-off for Eigenvalues greater than one. This approach is consistent with the suggestions offered by Ferrando and Lorenzo-Seva (2000), and Costello (2005).

Table 107 shows the results of the principal component (Promax rotation) that was restricted to nine factors accounting for 61.4% of the variance. The first factor, Challenge/Involvement, accounted for 32.3% of the variance with an Eigenvalue of 16.88. Five of its items load strongly and clearly on its theoretical dimension, while two other items share a stronger loading with the next factor, Idea-Support.

The second factor, Idea-Support, accounted for 7.3% of the variance with an Eigenvalue of 3.8. All five of its items load appropriately on the theoretical dimension.

The third factor, Conflict, accounted for 4.4% of the variance with an Eigenvalue of 2.28. All six of the Conflict items on this version of the SOQ load strongly and clearly on its theoretical dimension.

The fourth factor, Idea-Time, accounted for 4.2% of the variance and had an Eigenvalue of 2.2. All six items on this dimension of the SOQ load strongly on its dimension, with only one of the six co-loading to a lesser degree on the Idea-Support factor.

The fifth factor, Risk-Taking, accounted for 3.8% of the variance and had an Eigenvalue of 2. This factor showed the greatest improvement from the previous version of the SOQ. All five items load rather strongly on their appropriate theoretical dimension with only one of the five co-loading, to a lesser degree on Idea-Support.

The sixth factor, Debate, accounted for 3.1% of the variance and had an Eigenvalue of 1.6. All six items load clearly on their theoretical dimension.

The seventh factor, Freedom, accounted for 2.4% of the variance and had an Eigenvalue of 1.24. Five of the six items on this scale load clearly and rather strongly on its appropriate theoretical dimension. One item loads heavier on the Risk-Taking dimension.

The eighth factor, Playfulness/Humor, accounted for 2.1% of the variance and had an Eigenvalue of 1.1. All six items on this scale load heavily on its appropriate theoretical dimension. One of the six items also loads on the Idea-Support dimension, but to a lesser degree.

The ninth, and final factor, Trust/Openness, accounted for 1.8% of the variance and had an Eigenvalue of .9. If we had arbitrarily cut off the rotation at an Eigenvalue of one, we would have lost this factor. Three of the Trust/Openness items load on their dimension. Two other items load more heavily on other dimensions; one with Challenge/Involvement and the other with Playfulness/Humor.

In general, the factor structure for a nine-factor solution was coherent and rather reflective of the nine theoretical dimensions of the SOQ version 6. Although progress had been made on the internal consistency and factor structure of the Risk-Taking dimension, further developmental work focused on the improvement of the Trust/Openness dimension in version 7 of the SOQ.

Table 107
Principal Component (Promax Rotation) Analysis
SOQ version 6 items (n = 4730)

Theoretic scale	Component								
	1	2	3	4	5	6	7	8	9
Challenge/Involvement	.806								
Challenge/Involvement	.710								
Challenge/Involvement	.705								
Challenge/Involvement	.656								
Challenge/Involvement	.592								
Challenge/Involvement	.455	.711							
Challenge/Involvement	.323	.649							
Idea-Support		.690							
Idea-Support		.653							
Idea-Support		.514							
Idea-Support		.478							
Idea-Support		.442							
Conflict			-.840						
Conflict			-.814						
Conflict			-.814						
Conflict			-.801						
Conflict			-.760						
Conflict			-.684						
Idea-Time				.951					
Idea-Time				.914					
Idea-Time				.829					
Idea-Time				.815					
Idea-Time				.535					
Idea-Time		.321		.535					
Risk-taking					.924				
Risk-Taking					.769				
Risk-Taking					.726				
Risk-Taking					.461				
Risk-Taking		.330			.455				
Debate						.920			
Debate						.863			
Debate						.812			
Debate						.775			
Debate						.767			
Debate						.434			
Freedom							.840		
Freedom							.783		
Freedom							.755		
Freedom							.693		
Freedom							.638		
Freedom					.380				
Playfulness/Humor								.895	
Playfulness/Humor								.832	
Playfulness/Humor								.791	
Playfulness/Humor								.738	
Playfulness/Humor								.679	

Playfulness/Humor		.401						.508	
Trust/Openness									.934
Trust/Openness									.860
Trust/Openness									.343
Trust/Openness								.426	
Trust/Openness	.658								
Eigenvalues	16.79	3.77	2.28	2.20	1.98	1.63	1.24	1.07	0.94
% Variance Accounted for by Factors	32.29	7.25	4.39	4.23	3.81	3.13	2.39	2.07	1.80

Evidence based on Relations to Other Variables

Creative Climate, Suggestions, Recognition Awards and Creative Performance

Purpose and Sample. The purpose of this study was to identify the relationships between the climate dimensions and other factors important to organizations. These factors included creative performance, approved suggestions, and recognition awards for excellent performance. Data for these variables were collected from employees working in a forging plant. This plant, located in Western New York, manufactured automobile parts. Sixteen teams from the forge plant participated in the study (10 hourly work unit teams; human resource management; and five different leadership teams). A total of 149 measures were completed (a small number of the participants were on more than one team).

Creative performance was measured by the Survey of Creative and Innovative Performance (SCIP; Puccio, 1990; Puccio, Treffinger, & Talbot, 1995). This is a 14 item self-report instrument designed to assess the degree to which people feel the products they produce at work are creative. The fourteen product characteristics measured by the SCIP were based on the work of Besemer and her colleagues (Besemer & O'Quin, 1987; Besemer & Treffinger, 1981). Besemer organized these product criteria into three categories called Novelty, Resolution, and Elaboration/Synthesis (Besemer, 1998; Besemer & O'Quin, 1999).

Table 108 provides a brief description of the product criteria. Each criterion is placed into a statement that has the respondent indicate the degree to which he or she believes it describes his or her products at work. The SCIP examines creative performance within the work setting and therefore relationships should exist between perceptions of climate and perceptions of performance within this setting.

Table 108
Characteristics of Creative Product

Novelty:
Original - Uniqueness of the product.
Germinal - The degree to which the product leads to spin off ideas.
Transformational - The amount of impact of the product.

Resolution:
Adequate - The product's ability to respond to enough of the needs associated with the problem to be solved.
Appropriate - The degree to which the product fits the problem for which it was created.
Logical - The degree to which the product conforms to the standard conventions in its field or discipline.
Usefulness - The general applicability of the product.
Valuable - The product's ability to fill psychological, financial, social or physical needs.

Elaboration/Synthesis:
Complex - Products that possess many components or aspects.
Elegant - Products that present a complex idea in a refined manner.
Attractive - The degree to which product catches the attention of others.
Expressive - Products that communicate clearly their purpose.
Organic - The degree to which the product conveys a sense of completeness.
Well-crafted - The extent to which the product reflects hard work and craftsmanship.

Results and Discussion. Pearson correlations were carried out to examine relationships between the product criteria and the climate dimensions. If climate is related to how people perceive their performance, then significant relationships will exist between the SCIP items and the dimension scores. Table 109 shows the results of this analysis. This analysis yielded 85 significant relationships out of a possible 126 thereby indicating a strong link between individuals' perceptions of their work climate and the qualities of the products they produce at work.

Table 109
Pearson Correlations between Perceptions of Climate and Products

	Climate Dimensions (N = 141[a])								
	Challenge/ Involvement	Freedom	Trust/ Openness	Idea-Time	Playfulness/ Humor	Conflict	Idea-Support	Debate	Risk-Taking
SCIP									
Novelty:									
Original	.13	.18*	.18*	.22**	.10	-.00	.24**	.18*	.29***
Transf.	.23**	.22**	.14	.24**	.23**	-.04	.22**	.20*	.30***
Germinal	.13	.16	.18*	.14	.02	-.12	.17*	.12	.21**
Resolution:									
Adequate	.27**	.18*	.26**	.32***	.28**	-.26**	.32***	.29***	.21**
Appropriate	.29***	.18*	.23**	.22**	.10	-.13	.24**	.28***	.17*
Logical	.21**	.18*	.21*	.21*	.10	-.18*	.25**	.12	.14
Usefulness	.29***	.18*	.15	.19*	.04	-.19*	.24**	.19*	.12
Valuable	.28***	.10	.18*	.22**	.17*	-.13	.25**	.14	.10
Elaboration/Synthesis:									
Complex	.10	.21*	.18*	.18*	.10	-.04	.14	.28***	.24**
Elegant	.28***	.20*	.23**	.28***	.12	-.13	.31***	.22**	.20*
Attractive	.16	.13	.01	.09	.00	.00	.05	.11	.18*
Expressive	.24**	.24**	.25**	.24**	.15	-.10	.23**	.26**	.31***
Organic	.36***	.25**	.31***	.31***	.25**	-.24**	.41***	.35***	.28***
Well-craft.	.31***	.11	.25**	.27**	.26**	-.13	.29***	.25**	.17*

a = complete cases only
* p < .05 ** p < .01 *** p < .001

The coefficients found in this table point to a number of important findings. As expected the sole negative dimension, Conflict, yielded the only negative coefficients. This indicates that perceptions of such product characteristics as adequate, logical, usefulness and organic are inversely related to perceptions of the amount of conflict found in an individual's work team. More specifically, as Conflict decreases, the positive perceptions of these product characteristics increases.

It is also interesting to note that the strongest coefficients for Risk-Taking were found for product characteristics associated with Novelty and Elaboration/Synthesis. In particular, Risk-Taking was strongly related to original, transformational, expressive, and organic product characteristics. To create many of these characteristics in forged automobile parts or in a manufacturing environment may require more Risk-Taking on the part of employees. In contrast, non-significant relationships were

found for logical, useful, and valuable. These coefficients indicate that these more straightforward product criteria are not related to the amount of risk employees perceive in their work environment. Given the fairly strict parameters that these employees worked within it is not surprising that taking risks had little to do with logical, useful, and valuable products. Some of the climate dimensions that were highly related to perceptions of products included Challenge, Idea-Time, and Idea-Support. Each of these dimensions showed strong relationships across the product characteristics.

A second statistical test was carried out to further examine the link between employees' perceptions of the climate dimensions and their descriptions of their performance. A Mann-Whitney U was used to compare the respective perceptions of the climate dimensions of employees who reported high or low amounts of each product characteristic. A split at the mean score for each of the 14 product characteristics was used to categorize employees as high or low on each product criterion (e.g., original=6.61; useful=7.60; and expressive=7.13). Although nonparametric tests, such as the Mann-Whitney U are less powerful than parametric procedures, the former should be used when interval data are not normally distributed (Sprinthall, 1982), as was the case for the SCIP. This procedure gave a rank score, highest to lowest (i.e., the highest score for a climate dimension would receive a rank of one, the next highest a two, and so on), for the subjects for each climate dimension. The mean ranks for the two groups (high and low product characteristics) were then compared for significant differences. This analysis was carried out for all subjects who completed both the climate measure and the SCIP (n=141). Table 110 shows the significant results found for each of the climate dimensions.

Table 110
Significant Differences in Climate for High and Low SCIP Scores

Characteristic	SCIP High Scores (N) SOQ Rank	SCIP Low Scores (N) SOQ Rank	Significance
Challenge/Involvement:			
Original	65.54 (85)	79.29 (56)	.05
Transformational	63.96 (83)	81.08 (58)	.01
Adequate	64.69 (82)	79.77 (59)	.03
Appropriate	60.63 (67)	80.39 (74)	.00
Usefulness	63.37 (89)	84.07 (52)	.00
Valuable	65.42 (83)	79.98 (58)	.05
Attractive	64.65 (80)	79.33 (61)	.03
Expressive	61.73 (74)	81.24 (67)	.00
Organic	53.74 (54)	81.71 (87)	.00
Well-Crafted	59.83 (59)	79.04 (82)	.01
Freedom:			
Original	64.08 (85)	81.50 (56)	.01
Transformational	63.07 (83)	82.34 (58)	.01
Adequate	63.34 (82)	81.65 (59)	.01
Appropriate	62.44 (67)	78.75 (74)	.02
Usefulness	65.03 (89)	81.22 (52)	.02
Elegant	65.72 (88)	79.76 (53)	.05
Attractive	63.72 (80)	80.54 (61)	.02
Expressive	61.15 (74)	81.88 (67)	.00
Trust/Openness:			
Appropriate	60.65 (67)	80.37 (74)	.00
Usefulness	63.94 (89)	83.09 (52)	.01
Expressive	59.86 (74)	83.31 (67)	.00
Organic	52.19 (54)	82.68 (87)	.00
Idea-Time:			
Original	62.21 (85)	84.34 (56)	.02
Transformational	64.20 (83)	80.72 (58)	.01
Adequate	61.13 (82)	84.71 (59)	.00
Usefulness	65.13 (89)	81.05 (52)	.03
Elegant	64.11 (88)	82.43 (53)	.01
Expressive	64.55 (74)	78.12 (67)	.05

(continued)

Significant Differences in Climate for High and Low SCIP Scores

Characteristic	SCIP High Scores (N) SOQ Rank	SCIP Low Scores (N) SOQ Rank	Significance
Organic	56.19 (54)	80.19 (87)	.00
Well-Crafted	59.92 (59)	78.97 (82)	.01
Playfulness/Humor:			
Original	64.92 (85)	80.22 (56)	.03
Transformational	61.83 (83)	84.12 (58)	.01
Adequate	62.99 (82)	82.13 (59)	.01
Organic	56.44 (54)	80.04 (87)	.00
Conflict:			
Adequate	77.23 (82)	62.35 (59)	.03
Usefulness	77.79 (89)	59.38 (52)	.01
Organic	85.81 (54)	61.80 (87)	.00
Idea Support:			
Original	63.16 (85)	82.90 (56)	.00
Transformational	64.45 (83)	80.37 (58)	.02
Appropriate	63.49 (67)	77.80 (74)	.04
Adequate	61.74 (82)	83.87 (59)	.00
Usefulness	64.52 (89)	82.10 (52)	.01
Valuable	65.02 (83)	79.56 (58)	.04
Elegant	64.82 (88)	81.26 (53)	.02
Expressive	64.03 (74)	78.70 (67)	.03
Organic	51.72 (54)	82.97 (87)	.00
Well-Crafted	59.57 (59)	79.23 (82)	.00
Debate:			
Original	65.61 (85)	79.19 (56)	.05
Complex	64.19 (71)	77.91 (70)	.05
Adequate	62.95 (82)	82.19 (59)	.01
Appropriate	59.76 (67)	81.18(74)	.00
Usefulness	63.91 (89)	83.13 (52)	.01
Expressive	62.26 (74)	80.66 (67)	.01
Organic	58.24 (54)	78.92 (87)	.00
Well-Crafted	63.09 (59)	76.69 (82)	.05
Risk-Taking:			
Original	63.02(85)	83.12 (56)	.00
Transformational	61.38 (83)	84.77 (58)	.00
Germinal	65.08 (79)	78.54 (62)	.05
Adequate	64.86 (82)	79.53 (59)	.03

(continued)
Significant Differences in Climate for High and Low SCIP Scores

Characteristic	SCIP High Scores (N) SOQ Rank	SCIP Low Scores (N) SOQ Rank	Significance
Appropriate	62.13 (67)	79.03 (74)	.01
Usefulness	65.65 (89)	80.15 (52)	.05
Expressive	61.61 (74)	81.37 (67)	.00
Organic	59.63 (54)	78.06 (87)	.01
Well-Crafted	62.36 (59)	77.22 (82)	.03

The findings listed in Table 110 show significant differences for each of the nine climate dimensions. These results indicate that employees who say that various product characteristics are highly descriptive of their work also perceive a climate that is much more conducive to creativity. In every comparison for the product characteristics, employees in the high product category saw the climate dimension in a significantly more positive way. This is evident particularly when the rank scores for Conflict are compared to the other dimensions. Each of the significant findings for Conflict are in the opposite direction; those in the high group on the product characteristics (i.e., Adequate, Usefulness, and Organic) saw significantly less Conflict than their counterparts.

Several of the dimensions that in particular seemed to distinguish the high and low product groups were Challenge/Involvement and Idea-Support. Significant differences were found for 10 of the 14 product characteristics for both of these dimensions. Additionally, it is interesting to note that Risk-Taking was the only climate dimension that showed significant differences across all three product characteristics associated with Novelty. In particular, very large differences were found for original and transformational. This is not surprising as taking risks is often associated with novel thinking.

The many significant differences found between the two groups indicate that employees associated the qualities of the products they produced with the psychological climate in which they work. All of the findings reported in Table 109 are in the expected direction. As perceptions of climate move in the positive direction so

do perceptions of performance. Although cause-and-effect cannot be deduced from these findings, they clearly indicate that employees who perceive a more positive work environment feel more positive about the work they produce.

The final analysis examined the climate dimensions in regard to recognition awards. These non-monetary rewards are given to hourly employees who do something extraordinary at work. These extraordinary acts could be related directly to work, such as taking the initiative to avert a scrap problem that would have cost the organization thousands of dollars, or could be focused on community service, such as fund raising for a charity. To receive a recognition award, employees must be nominated by a co-worker (hourly or salary). The nomination is submitted to a Recognition Committee that evaluates the merit of the act. Recipients receive non-monetary awards, such as gift certificates and meals. Each quarter a banquet is held for all recent recognition award recipients.

All employees who received a recognition award in the 18 months prior to completing the climate measure were identified. A total of ten employees had received recognition awards in this time period. Table 111 shows an analysis that compares perceptions of the working climate between employees who had received recognition awards and those who had not received such awards. Since recognition awards were given only to hourly employees, this analysis was limited to the ten hourly work unit teams. Further, given the unequal size of the two comparison samples a nonparametric statistic, Mann-Whitney U, was used.

Table 111
Examining Recognition Rewards and Creative Climate

Dimension	No Awards (N = 88) Mean Rank	Rec. Awards (N=10) Mean Rank	Z	Significance
Challenge/Involvement	51.76	29.65	-2.34	.02
Freedom	50.57	40.05	-1.11	.27
Trust/Openness	51.39	32.90	-1.96	.05
Idea-Time	51.28	33.80	-1.85	.07
Playfulness/Humor	51.65	30.60	-2.23	.03
Conflict	49.19	52.20	-0.32	.75
Idea-Support	52.68	21.55	-3.29	.00
Debate	51.59	31.10	-2.17	.03
Risk-Taking	51.82	29.10	-2.41	.02

In general, the results shown in Table 111 indicate that those who received recognition awards perceived a much more nurturing climate at work. Specifically, these employees perceived significantly greater amounts of Challenge/Involvement, Trust/Openness, Playfulness/Humor, Idea-Support, Debate and Risk-Taking. Although the group of employees who received recognition awards is small, the mean rank order for the climate dimensions show that as a group these employees possessed very different perceptions of many of the climate dimensions.

It is not possible to conclude from this investigation whether recognition awards enhance an individual's perceptions of the climate dimensions or if the employee achieves extraordinary levels of performance as a result of experiencing a positive climate. These results simply indicate that recognition awards and climate seem to be related. It would seem that either proposition would lead to beneficial outcomes. For example, one approach would indicate that by implementing a recognition or award system, the climate for creativity would improve within the organization. The other view would indicate that as the climate for creativity improves, employees would be more likely to engage in extraordinary levels of performance. Again, either relationship leads to positive results for the organization and its employees.

Creative Climate and Best/Worst-Case Scenarios

Study 1

The ability of the SOQ to discern climates that either encourage or discourage creativity was examined. Individuals were asked to think of the best climate for creativity and change they had ever experienced, and then to do the same for the worst climate they had experienced. These results were shared by Britz (1995) and published by Isaksen, Lauer, Ekvall and Britz (2001).

Purpose and Sample. This example of validity departs from the previous examples in that it did not compare the SOQ to other measures, but rather it compared the SOQ to itself. Thus, it is not a strict example of concurrent validity, but nevertheless provides important information about the accuracy of the SOQ and its ability to discriminate climates for creativity.

The methodology used in this study compared individuals' perceptions of the climate dimensions for a very positive or "best-case" situation against a negative or "worst-case" situation. Respondents completed the SOQ for a best-case and a worst-case situation. The best-case was defined as "an environment in which you felt you did your best work because it encouraged, nurtured or supported your use of creativity." The worst-case was characterized as “an environment in which you felt unproductive because it discouraged, hindered or interfered with your use of creativity."

It was hypothesized that if the SOQ was an accurate measure of the psychological climate for creativity then it would be sensitive enough to show distinct differences between very favorable and unfavorable situations. By having respondents think back to a real work situation that could be characterized as either very positive or negative, the perceptions of the climate dimensions could then be compared across these situations. No difference in individuals' perceptions across the two scenarios would call into question the SOQ's ability to accurately assess psychological variables purported to nurture creative performance.

This procedure was carried out twice. The first time involved a group of 22 (14 males; 8 females) managers from an international computer company. The age for this group ranged from 32 to 58. Examples of the best-case for this group were: negotiating with union, intercultural video creation, and internal training center. Examples of the worst-case included: post merger environment, executive development program, and development of a product database.

The second group to complete the SOQ in this manner included 24 (11 male; 13 female) graduate students enrolled in a course at the Center for Studies in Creativity at Buffalo State College. The age for this group ranged from 25 to 56. Examples of the best-case situation identified by the students included: teaching in college, working as a journalist for a newspaper, and technology marketing. Examples of the worst-case situation included: working in a psychiatric center, teaching in a middle school, and working as a waitress.

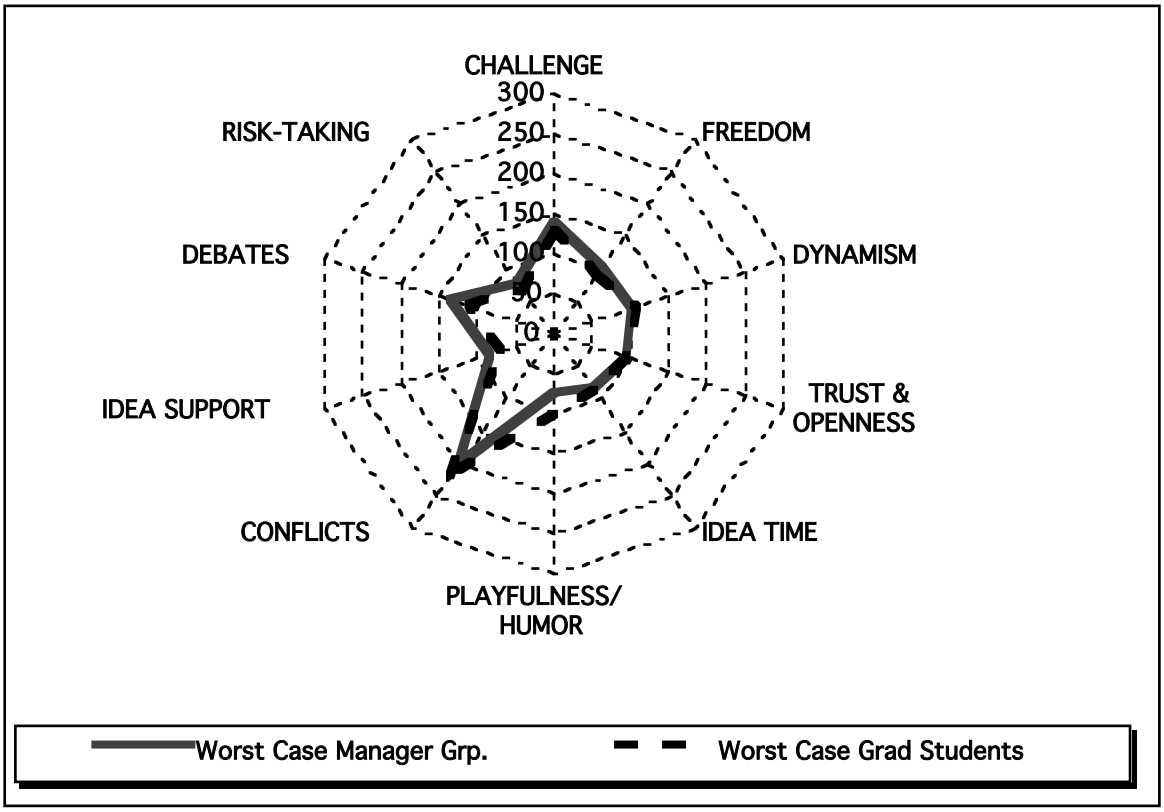
Results and Discussion. Britz (1995) analyzed the data collected from the two samples described above. Table 112 shows the mean scores for the best and worst-case situations for both samples and Table 113 and Table 114 present graphic depictions of these scores.

Table 112
Mean Scores for Best and Worst-Case Situations

	Manager Group (N=22)		Student Group (N=24)	
Dimension	**Best Case**	**Worst Case**	**Best Case**	**Worst Case**
Challenge/Involve.	259	138	263	130
Freedom	227	104	226	89
Dynamism	239	103	235	111
Trust/Openness	219	94	218	94
Idea-Time	155	83	209	86
Playfulness/Humor	213	72	243	99
Conflict	92	204	74	219
Idea-Support	232	85	233	69
Debate	238	137	228	113
Risk-Taking	208	77	185	67

A visual comparison of the scores for the best-case and worst-case situations between the two samples shows remarkable similarities (see Table 113 and Table 114). In general, the scores for the best-case situation approach the high end of the scale (300), except for Conflict (negative dimension), and the scores for the worst-case approach the low end of the scale (0), again except for Conflict. To determine if these differences were statistically significant, Britz carried out an Analysis of Variance (ANOVA).

Table 113
Comparison of Mean Scores for Worst-Case Situations

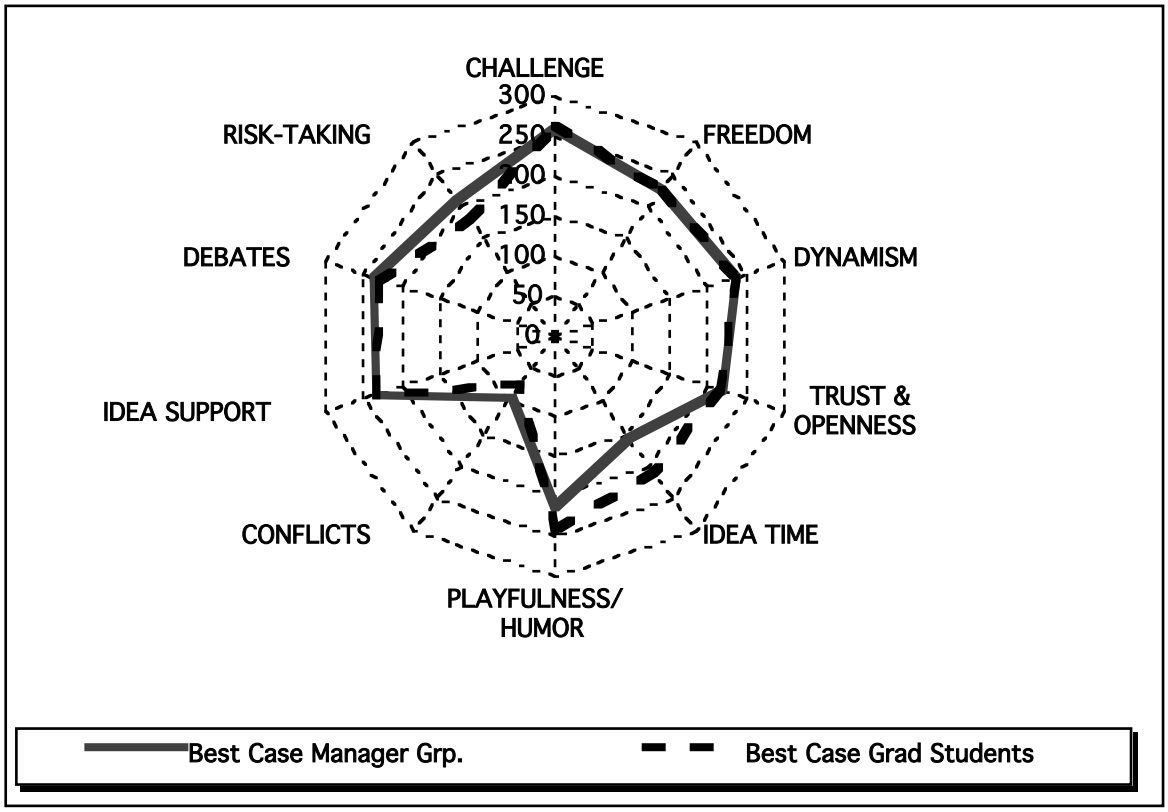


Results from this analysis are found in Table 114. For both samples all comparisons between the best and worst-case yielded significant differences.

Results from Britz's analysis show that the SOQ can discriminate between productive and unproductive work situations experienced by two different sets of people. All nine dimensions showed large and statistically significant differences across the

best and worst-case situations. These results are critically important in that they demonstrate that respondents will vary their answers to the SOQ given very different work environments. Additionally, respondents will vary their answers in the theoretically hypothesized direction (i.e., positive environments receive more positive scores and negative environments receive more negative scores).

Table 114
Comparison of Mean Scores for Best-Case Situations



Subsequent analysis carried out by Britz (1995) compared the scores for the best-case situations and the worst-case situations across the two samples. Here Britz was trying to discover if the scores for the best and worst-case situations were relatively identical. This analysis revealed only one significant difference. Idea-Time for the best-case situation produced a small, but statistically significant difference ($F=5.84$, $p<.05$). Thus, the patterns across the best and worst-case situations for the two groups were relatively identical.

Table 115
Analysis of Differences Between Best and Worst Case

Dimension	Manager Group (N=22) F-Value*	Student Group (N=24) F-Value*
Challenge/Involvement	76.8	93.0
Freedom	60.0	49.1
Trust/Openness	66.0	99.9
Idea-Time	13.1	31.1
Playfulness/Humor	60.6	107.5
Conflict	29.6	77.7
Idea-Support	100.5	102.5
Debate	27.9	56.1
Risk-Taking	66.3	36.9

* all p values less than .001; n=22, df=42; n=24, df=46

Additional analyses were carried out using MANOVA to examine interaction effects for both groups. The only significant interaction occurred for the best-case data set. The results indicated that within all the best-case results, the student group had a significant difference with the manager group on Idea-Time. The difference favored the student group and that can be explained in part by the fact that the busy professionals were working for an international organization and the students were engaged in a multi-year graduate program.

Study 2

A follow up from the first study of best and worst-case climates was conducted using a short form of the SOQ. This form included nine questions, one for each of the nine dimensions of the SOQ. Two forms were distributed to the respondents. One asked them to identify their best-case work situation – one in which they felt that they were able to contribute their creativity. The other form asked them to identify their worst-case work situation – one in which they felt they were unable to

contribute their creativity. Data collection included an undergraduate class enrolled in an elective Humanities course. This course was selected due to its size and the diversity of the students enrolled. Students volunteered to have their data included in the study. The students' ages ranged from 18 to 56 with an average age of 27.3. The class consisted of 27 males and 44 females.

The group's scores on the Kirton Adaption-Innovation Inventory (Kirton, 1999) showed a fairly normal distribution and a mean score that was close to the theoretical mean (Mudd, 1986). The KAI Inventory is a 32-item instrument on which respondents are asked to indicate the degree of ease or difficulty they have in maintaining specific adaptive or innovative preferences over a long period of time. This suggested that this group was fairly representative of the normal population, and would provide a better sample than those presented in the previous study. The Kirton Adaption-Innovation Inventory (KAI) means for the other two groups were substantially more innovative.

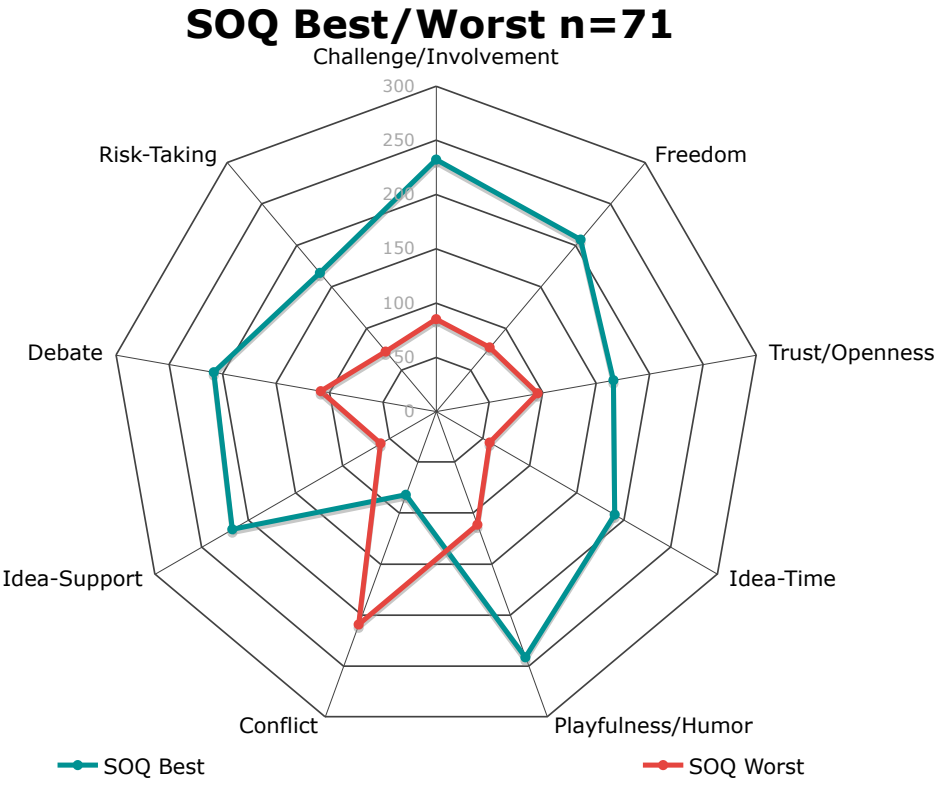
Results and Discussion. The results from this study show remarkably similar patterns to the first study in the numeric data and their visual display. The means on the nine dimensions of the SOQ are reported in Table 116.

Table 116
Descriptive Statistics n=71

Dimension	Sample	M	SD	N
Challenge/Involvement	Best	232.39	56.163	71
	Worst	84.51	53.220	71
	Total	158.45	92.079	142
Freedom	Best	206.81	58.390	71
	Worst	77.23	49.058	71
	Total	142.02	84.349	142
Trust/Openness	Best	165.73	86.368	71
	Worst	94.84	66.821	71
	Total	130.28	84.766	142
Idea-Time	Best	189.91	64.702	71
	Worst	56.81	51.914	71
	Total	123.36	88.750	142
Playfulness/Humor	Best	240.61	59.544	71
	Worst	110.80	71.498	71
	Total	175.70	92.416	142
Conflict	Best	81.69	71.445	71
	Worst	208.92	72.256	71
	Total	145.31	95.925	142
Idea-Support	Best	217.18	71.896	71
	Worst	58.59	50.520	71
	Total	137.89	100.825	142
Debate	Best	207.51	61.579	71
	Worst	108.22	60.872	71
	Total	157.86	78.768	142
Risk-Taking	Best	167.25	64.585	71
	Worst	71.83	56.841	71
	Total	119.54	77.249	142

The spider chart for the results from the 71 students is shown in Table 117.

Table 117
Comparison of Mean Scores for Best-Case Situations – Student Dataset



The SOQ provided consistent results in the expected direction. The best-case results were all more positive than the worst-case situations, except for Conflict where the worst-case average would be expected to be higher on this negative dimension. The worst-case results were all lower and also in the expected direction, except for Conflict which yielded higher scores showing a more negative climate for creativity and change.

Table 118
ANOVA on SOQ Best/Worst n = 71

Dimension	df	F	Sig.
Challenge/Involvement	1	259.4	0.000
Freedom	1	205.0	0.000
Trust/Openness	1	30.0	0.000
Idea-Time	1	182.8	0.000
Playfulness/Humor	1	138.2	0.000
Conflict	1	111.3	0.000
Idea-Support	1	231.3	0.000
Debate	1	93.4	0.000
Risk-Taking	1	87.3	0.000

Consistent with the analysis conducted in the first study, a 9 (SOQ Dimensions) by 2 (situation: best, worst) MANOVA was applied to the means from best and worst-case climates. As in the previous study a significant interaction was observed [Wilks' Lambda =.255, $F(9,132)=42.80$, $p<.001$]. Univariate F-tests were then applied and all the means were significantly different (see Table 118). The 71 best-case situations chosen by the undergraduate students were clearly different from their 71 worst-case situations.

Study 3

Purpose and Sample. This study used data from 174 individuals who had completed the same short form best and worst-case SOQ used in the previous studies. The respondents were members of organizations that contracted with the Creative Problem Solving Group (CPSB) for training in Creative Problem Solving (N = 104) while 70 were participants in educational courses.

The complete group consisted of 87 males, 86 females and 1 individual who declined to indicate gender. The mean age of the respondents (n = 162) who reported their age was 34.51 years with a range of 17 to 68 years. From the 104 respondents coming

from an organization, 51% were directors, CEO's, board members or senior managers while 49% consisted of a group of mixed professionals. From a total of 174 participants, 70 came from an educational institution, 34% were graduate students enrolled in master's level business courses, and 66% were undergraduates. The graduate students were enrolled in an MBA program at Wilkes University (Pennsylvania) and one Norwegian management university, and the undergraduates all came from business classes at the University of Great Falls (Montana).

The data collected from the directors, CEO's, board members and senior managers came from 3 different events. One was done with one of the Big Four accounting firms. Another took place with one of the largest nonprofit providers of education, training, and career services, and the last one was done at a leadership conference hosted by the University of Great Falls.

The data collection procedure was counterbalanced so that the order in which they completed the forms changed from best to worst and the next subject was asked to complete the forms worst first and then best. The respondents were also asked to indicate the work climate they were thinking about when completing the form. This was done to ensure a good response set for the dimensional questions. All subjects identified two specific work situations, one that represented their best-case experience, and another for their worst-case work experience. This resulted in a consideration of 348 different work environments.

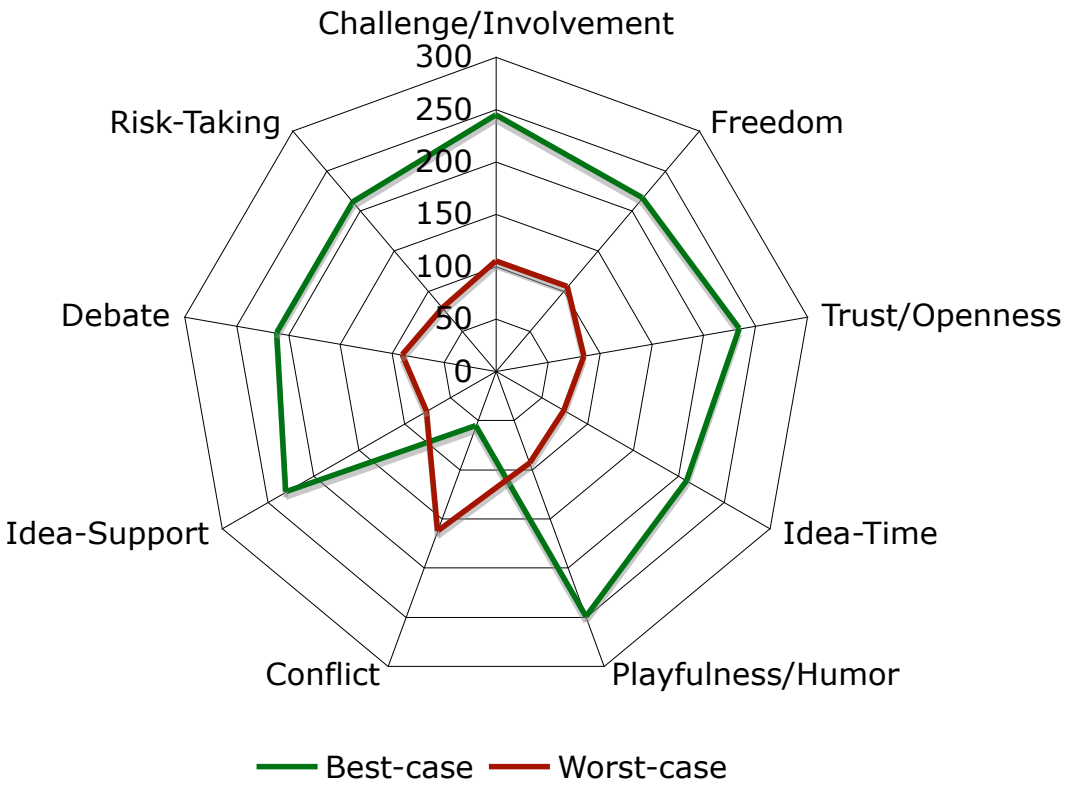
Results and Discussion. Table 119 displays the descriptive statistics for both the best and worst-case short forms of the SOQ. The means for the best-case situation are higher than the worst-case for all eight positive dimensions and lower on Conflict, the one negative dimension.

Table 119
Descriptive Statistics SOQ (n = 174)

SOQ Dimension	Best-case (means)	Worst-case (means)	Best-case Range	SD	Worst-case Range	SD
Challenge/Involvement	244	105	50 - 300	48.75	0 - 300	67.46
Freedom	216	105	50 - 300	59.33	0 - 300	72.34
Trust/Openness	234	85	30 - 300	62.04	0 - 300	60.11
Idea-Time	209	74	50 - 300	63.90	0 - 250	52.33
Playfulness/Humor	249	93	0 - 300	55.25	0 - 300	69.69
Conflict	55	162	0 - 250	53.24	0 - 300	91.54
Idea-Support	230	76	50 - 300	57.88	0 - 250	52.32
Debate	211	90	0 - 300	59.85	0 - 300	61.46
Risk-Taking	211	79	0 – 300	67.38	0 - 300	60.26

Table 120 provides a graphic presentation of the means for the best- and worst-case climates for this sample.

Table 120
Comparison of mean scores: best and worst-case



In order to reduce the likelihood of a Type I error when examining differences for the best and worst-case situations, multivariate analysis of variance (MANOVA) was conducted on the sample. The analysis was done on the 9 SOQ dimensions combined with the best and worst-case situations. There was a significant interaction for this sample, Wilks' Λ = .216, $F(9,338)$ = 136.24, $p<.0001$.

A univariate F test (ANOVA) was then conducted between the best and worst-case results.

Table 121
Univariate F Test Between Best-Case and Worst-Case Scores
SOQ Dimension

SOQ Dimension	F*
Challenge/Involvement	481.84
Freedom	243.30
Trust/Openness	517.81
Idea-Time	462.33
Playfulness/Humor	540.55
Conflict	177.30
Idea-Support	675.57
Debate	347.40
Risk-Taking	369.01

* all p<.0001, df = 1

All 9 dimensions of the SOQ showed significant differences across the two situations (Table 121). These results were consistent with the earlier studies.

Study 4

Purpose and Sample. A fourth study used data from 27 individuals who had completed a best and worst-case SOQ assessment in the long form. All of the subjects were students in a Belgian school of higher learning as part of an international educational program. These students participated in a creativity and innovation class as a mandatory course in their studies. The instructor, who was an SOQ Qualified Practitioner, collected the SOQ data. The sample included Belgian, Polish and Turkish students. The Belgian students completed the SOQ in Dutch, and the Polish and Turkish students completed the SOQ in English. All participants indicated their gender and age. There were 14 male students and 13 female students who participated and ages varied from 20 to 25 years with a mean age of 21.44.

The students were requested to complete the full web-based forms of the Situational Outlook Questionnaire® (SOQ). They completed one form for their best-case work situation, and another form for their worst-case work situation.

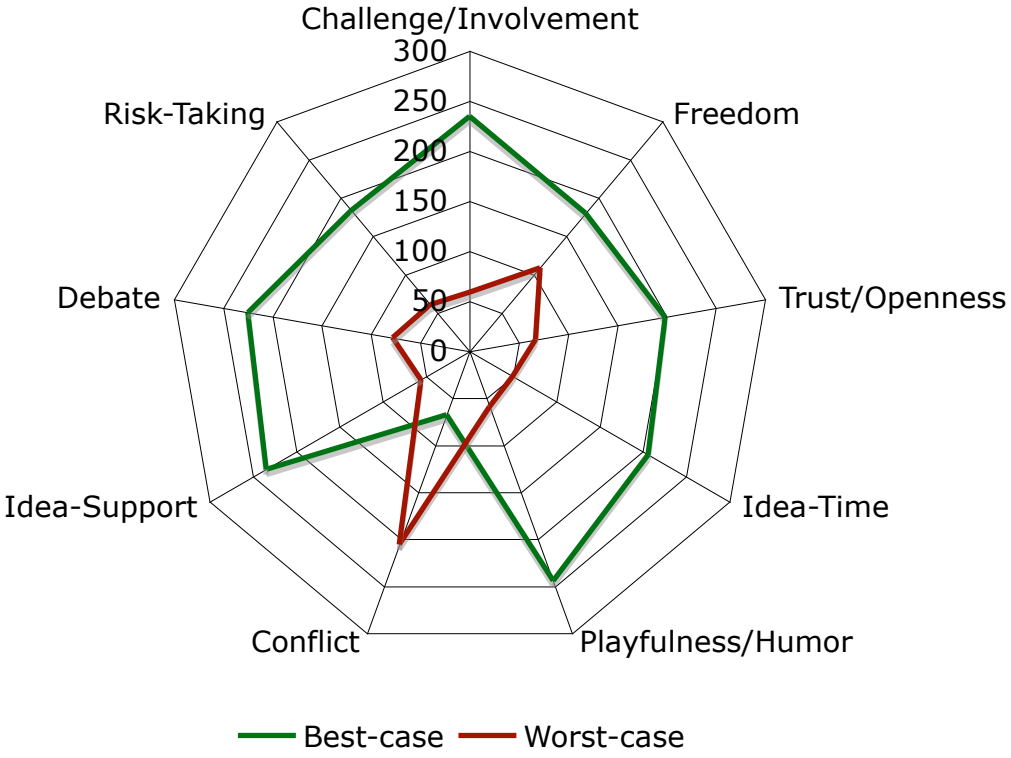
Results and Discussion. The descriptive statistics for the 27 students are included in Table 122.

Table 122
Descriptive Statistics SOQ (n = 27)

SOQ Dimension	Best-case (means)	Worst-case (means)	Best-case Range	SD	Worst-case Range	SD
Challenge/Involvement	234.33	58.78	129 – 300	49.62	0 – 214	64.46
Freedom	179.56	108.67	33 – 267	51.95	0 – 267	75.57
Trust/Openness	198.52	66.67	120 – 300	51.42	0 – 180	59.74
Idea-Time	205.52	49.41	100 – 300	60.99	0 – 183	56.71
Playfulness/Humor	243.19	58.70	100 – 300	50.18	0 – 183	62.03
Conflict	66.67	204.93	150 – 300	42.54	17 – 300	72.17
Idea-Support	234.07	55.56	0 – 183	49.56	0 – 220	65.71
Debate	224.70	77.81	133 – 300	53.59	0 – 200	75.93
Risk-Taking	183.70	60.74	80 – 300	53.79	0 – 200	48.51

The means for the eight positive dimensions are larger, and Conflict scores are lower for the best-case work situation. Table 123 shows the same results in a spider chart format.

Table 123
Comparison of Mean Scores for Best and Worst-Case Situation



A multivariate analysis of variance (MANOVA) was conducted to determine if there was an interaction between style and the two different situations, and to reduce the likelihood of a Type I error. The MANOVA applied a 9 (SOQ dimensions) x 2 (best-case and worst-case situation). The results yielded a significant interaction amongst the SOQ dimensions and the best-case and worst-case work situation (Wilks' Λ = .031 , $F(9,43) = 149.50$, $p<.0001$).

A univariate F test (ANOVA) was conducted on the sample between the best and worst-case data. The results are displayed in Table 124.

Table 124
Univariate F Test: Best and Worst-Case SOQ Scores
SOQ Dimension

SOQ Dimension	F*
Challenge/Involvement	120.08
Freedom	15.14
Trust/Openness	72.44
Idea-Time	90.70
Playfulness/Humor	148.39
Conflict	71.84
Idea-Support	122.48
Debate	64.18
Risk-Taking	74.84

* all p<.0001, df = 1

All 9 dimensions showed significant differences across the best and worst-case situations.

The results from all four of these studies provide rather clear evidence of the ability of the SOQ to discriminate best and worst-case working climate situations across diverse groups of respondents.

Creative Climate and Individual Differences

The climate for creativity, innovation and change is a social-psychological construct and is aimed at describing and defining the quality of the social context by acquiring and aggregating perceptions of those who share the same environment. As such, it may be influenced by a number of intrapersonal factors. Some of these may be age, gender, time in the job or organization, etc.

Within the broad research area of person-environment fit, one of the main concerns has been the degree of fit or agreement between the intrapersonal factors with the qualities of the situation (Edwards, Cable, Williamson, Lambert, & Shipp, 2006; Hult, 2005; Lichtmen & Hunt, 1971). This series of studies explored the degree of relationship between climate as assessed by the SOQ and a number of assessments of individual differences of cognitive and problem solving style.

Study 1A: The Initial Study

Purpose and Samples. This series of studies of the concurrent validity of the SOQ examined the relationships between the climate dimensions and individual differences. Individual differences commonly refer to variations across people on personal constructs, such as learning style, cognitive style, or personality type. The individual difference variables examined in regard to the climate dimensions were creativity styles (Kirton, 1976, 1994) and personality type (Myers, & McCaulley, 1985).

The essential question behind the relationship between these individual difference variables and climate is "do people with different styles and personalities possess similar or different perceptions of their team or organization's climate?"

The first study to examine individual differences in regard to perceptions of the climate dimensions measured by the SOQ was carried out by Isaksen and Kaufmann (1990, 1991). These researchers used an aggregated sample of 634 employees who worked in eight different public and private sector organizations. The individual difference measure used in this study was the Kirton Adaption-Innovation Inventory (Kirton, 1976). Kirton's measure assesses individuals' styles of creativity. Specifically, this measure indicates the extent to which the respondent prefers to adopt an adaptive or innovative style of creativity. Theoretically both types are equally creative; however, they approach problem solving, decision-making and creativity in characteristically different ways. Where adaptors prefer to work within the system to improve it, the innovators tend to challenge existing systems and paradigms. A more recent investigation using data collected at the Creative Problem Solving

Group also explored the relationship between the SOQ dimensions and adaptor-innovator preferences. This aggregated sample comprised 108 subjects.

One of the most popular measures of personality type has been the Myers-Briggs Type Indicator (MBTI; Myers-McCaulley, 1985). This measure, based on the work of Carl Jung, identified individuals' preferences along four scales: Extraversion-Introversion; Sensing-Intuition; Feeling-Thinking; and Judging-Perceiving. Briefly, Extraversion-Introversion refers to attitudes toward the world. Sensing-Intuition relates to how people take in information. Feeling-Thinking refers to different ways of making decisions. Judging-Perceiving refers to how individuals carry out their lifestyles. An aggregated sample of 43 employees had completed the SOQ and the Myers-Briggs Type Indicator. This sample was used to conduct a preliminary examination of the relationship between the MBTI and the SOQ dimensions.

Results and Discussion. In general, the results of the studies cited above yielded few significant relationships between individuals' perceptions of climate and their personality or creativity style. A total of only three significant findings were produced by these studies. No significant relationships were found between the MBTI and the SOQ dimensions. In regard to Kirton's measure, Isaksen and Kaufmann (1990, 1991) found significantly different perceptions of climate for two of the climate dimensions (Challenge and Conflict). Individuals with adaptive preferences perceived greater amounts of Challenge and individuals with an innovative style perceived greater levels of Conflict in their work environment. The more recent examination of the sample of 108 employees yielded no significant correlation between the climate dimensions and the total score of Kirton's measure; however, one significant coefficient was found for Kirton's Rule/Group Conformity subscale and Idea-Time ($r = -.19$, $p = .04$). This relationship indicates that as individuals' preferences to be less conforming increase, their perceptions of Idea-Time decreases.

Overall, these results indicate that an individual's perceptions of the psychological climate at work are relatively unrelated to their personality or creativity style. Thus, scores for the SOQ dimensions seem not to be influenced by these differences in people.

Study 1B: A Follow up to the First Study

Isaksen and Lauer (1999) provided further evidence of the independence of the creative climate dimensions from creativity style. The original study (Isaksen & Kaufmann, 1990 summarized above) was designed to investigate the extent to which the concepts of individual psychological climate and cognitive style were related. These two constructs are both intra-personal variables (at the individual level of analysis) and they have been described as conceptually linked in that both may help to predict actual creative behavior.

Isaksen and Kaufmann (1990) sought to determine if those with strong preferences for adaptive or innovative approaches to creativity style and managing change held different individual perceptions of the climate for creativity and change. Since both climate and cognitive style were thought to be predictive of different types of creative behavior, the original hypothesis was that some relationship should be found between the two measures. Since no earlier empirical investigations of these two variables could be discovered, the study was considered exploratory.

An aggregated population of 646 subjects from eight different public and private organizations located in the Northeast and Central United States participated in the study. Upon recompiling the data from the original 1990 study, 12 participants from the original organizations who were not available at the time of the original study were included. The senior author conducted Creative Problem Solving programs with these organizations and the data was obtained from the participants in accordance with the research policy of the Creative Problem Solving Group.

Two hundred and fifty-six of these adult participants came from an entire rural elementary school district and one suburban elementary school. Six different organizations provided 390 subjects (83 from a technical center within a large manufacturing company; 25 managers of a mid-west information company; 23 branch managers; 211 R&D managers within a large manufacturing company; 40 members of an R&D facility within a beverage manufacturing company; and 8 senior managers of a public service organization). The subjects included about 55% males (n=351) and 45% females (n=291). The gender of 4 subjects was unknown.

The Kirton Adaption-Innovation Inventory (Kirton, 1999) and a version of the Situational Outlook Questionnaire® (SOQ) were used in the original study. The Kirton Adaption-Innovation Inventory (KAI) is a 32-item instrument on which respondents are asked to indicate the degree of ease or difficulty they have in maintaining specific adaptive or innovative preferences over a long period of time. The range of scores is theoretically 32-160 on the KAI with a mean of 96. There is a great deal of literature regarding its validity and reliability (Kirton, 1994; 1999). Mudd (1986) has shown an actual mean for the general population to be 95.0, with a standard deviation of 14.9 (n=1719), a reliability of .86 (internal consistency; n=2777) and consistent factorial composition into three sub-scales. The three sub-scales include: sufficiency of originality (O); efficiency (E); and rule/group conformity (R). The means and standard deviations for the entire population and for male and female groupings for each instrument are provided in Table 125. The data reported in this table are similar to those reported in the original study. The additional 12 subjects beyond those reported in Isaksen & Kaufmann (1990) provided only minor variations. Gender differences are observed for both the SOQ and the KAI.

Correlation results, which were not included in Isaksen and Kaufmann (1990), are presented here in Table 126. None of the correlations show a strong relationship between the KAI and the SOQ. Thirteen out of 40 correlations between the total groups' KAI and SOQ scores were statistically significant. Eighteen out of 40 correlations between KAI and SOQ were significant for the 291 females. Only one of the 40 correlations was significant for the 351 males.

Given that the overall correlation results did not show any clear relationships between psychological climate and cognitive style, we sorted the subjects into two groups that should show very different cognitive orientations. Even though the KAI is a continuum, and not a dichotomy, it is possible to examine any specific distribution and identify a subset that is more adaptive or more innovative. The subjects in this study were sorted by identifying two groups, each one-half standard deviation above or below the observed mean on the KAI. This resulted in one group (n=212) having a stronger innovative orientation and another group (n=204) having a stronger adaptive orientation. Means and standard deviations for the two groups on the KAI and SOQ are shown in Table 125. The means for the more adaptive and innovative groups are nearly 39 points apart.

Table 125
SOQ & KAI Means and Standard Deviations - Males/Females

Variable	Entire Group (N=646)		Males (n=351)		Females (n=291)	
	M	SD	M	SD	M	SD
Challenge/Involve.	233	48	228	49	237	47
Freedom	187	52	185	52	190	51
Trust/Openness	163	58	164	58	161	57
Idea-Time	145	57	146	57	143	57
Playfulness/Humor	182	59	175	58	190	59
Conflict	81	63	91	64	69	60
Idea-Support	182	61	183	60	182	61
Debate	188	53	184	52	192	54
Risk-taking	146	53	143	54	149	52
KAI	100.03	17.20	103.32	16.67	96.04	17.05
KAI – O	44.52	8.33	45.55	7.93	43.20	8.60
KAI – E	19.10	5.37	19.89	5.45	18.18	5.13
KAI – R	36.39	7.68	37.88	7.56	34.61	7.46

The sorting of subjects in this study in this manner is in accordance with the notion of cognitive gap, as reported in the literature (Clapp & deCiantis, 1987; Kirton & McCarthy, 1988; Kirton & deCiantis, 1994). According to this notion, one standard deviation difference should result in two groups with distinctly different preferred approaches to problem solving, decision-making and creativity.

This type of separation is commonly used in KAI research focused on individual differences (Clapp, 1991; Hammerschmidt, 1996; Puccio, Joniak & Talbot, 1995).

Kirton & deCiantis (1994) noted, "...more than one standard deviation causes difficulties in integration and begins to raise noticeable problems of communication and strains in goodwill." (page 86). When we conducted this study we believed that it was likely that these two styles may also differ in how they view aspects of their climate for creativity and change.

Table 126
KAI/SOQ Correlations

	Challenge/ Involve.	Freedom	Trust/ Open	Idea-Time	Playful/ Humor	Conflict	Idea-Support	Debate	Risk-Taking
Entire Group									
KAI total	-.121 **	-.065	-.050	.021	-.063	.145 ***	-.006	-.066	-.067
KAI - O	-.056	-.015	-.008	.066	-.039	.116 **	.036	.020	.008
KAI - E	-.110 **	-.050	-.051	.024	-.007	.049	.017	-.082*	-.068
KAI - R	-.138 ***	-.097 *	-.070	-.044	-.103 **	.167 ***	-.068	-.117 **	-.115 **
Females									
KAI total	-.196 ***	-.080	-.084	-.062	-.082	.140 *	-.086	-.122 *	-.132 *
KAI - O	-.082	-.009	-.007	.061	-.054	.108	.001	-.011	.001
KAI - E	-.225 ***	-.135 **	-.135 *	-.084	-.022	.077	-.084	-.142 *	-.170 **
KAI - R	-.207 ***	-.084	-.099	-.162***	-.121 *	.147 *	-.142 **	-.173 **	-.193 ***
Males									
KAI total	-.026	-.036	-.036	.083	.007	.092	.062	.008	.011
KAI - O	-.006	-.006	-.019	.064	.013	.079	.074	.067	.038
KAI - E	-.004	.025	-.002	.103	.052	-.010	.091	-.013	.022
KAI - R	-.049	-.090	-.058	.041	-.035	.126 *	-.006	-.041	-.031

* = p≤ .05 ** = p≤.01 *** = p ≤.001

Since we had clearly different groups according to KAI theory, we submitted these two groups to discriminant analysis (Hair, Anderson & Tatham, 1987) to determine if they would show any statistically significant and meaningful differences in their orientation to individual psychological climate. The discriminant function allows for analysis of both groups across all climate variables. If there is a difference in how the two groups view climate, the two groups should remain distinctly separate with regard to any particular climate dimension.

Table 127
SOQ & KAI Means and Standard Deviations - Adaptors/Innovators

Variable	More Innovative n=212		More Adaptive n=204	
	M	SD	M	SD
Challenge/Involvement	224	50	238	47
Freedom	181	55	189	50
Trust/Openness	158	62	165	55
Idea-Time	144	62	141	53
Playfulness/Humor	179	59	187	56
Conflict	91	70	70	56
Idea-Support	180	66	183	55
Debate	183	60	191	49
Risk-Taking	140	57	150	46
KAI	119.31	8.37	80.44	8.40
KAI - O	51.96	5.58	36.77	6.46
KAI - E	23.59	4.59	15.10	3.80
KAI - R	43.74	5.14	28.57	4.53

The results of the discriminant function analysis are shown in Table 128. This table includes the percentage of classification for the overall analysis by each dimension of the SOQ. Both Challenge/Involvement and Conflict were found to be optimal predictor variables. This was consistent with the original study. The re-analysis showed that there were also statistically significant differences for the Risk-Taking dimension of the SOQ. These results indicate that adaptors view more Challenge/Involvement and Risk-Taking within their individual psychological climates than innovators. Innovators view more Conflict within their climates than adaptors.

Table 128
Discriminant Function Analysis & Percentage of Classification
SOQ & KAI Wilks' Lambda (U-Statistic) and Univariate F-Ratio (n=416)

Variable	Wilks' Lambda	F	Significance	% of Classification (total group 58.8)
Challenge/Involve.	0.9804	8.26	0.004	54.1
Freedom	0.9946	2.26	0.134	51.0
Trust/Openness	0.9965	1.46	0.228	50.0
Idea-Time	0.9995	0.20	0.656	52.4
Playfulness/Humor	0.9954	1.92	0.167	54.6
Conflict	0.9739	11.05	0.001	53.3
Idea-Support	0.9994	0.21	0.647	51.9
Debate	0.9956	1.84	0.176	54.6
Risk-Taking	0.9906	3.91	0.049	56.5

There are a number of possible explanations for these findings. Since we deliberately chose individuals with different cognitive styles we should expect to see differences in individual perceptions and interpretations of behavior that characterizes life in

organizations. In short, their point of view would be different, even in similar contexts. Adaptors may see certain behavior that is outside the norm more frequently as Risk-Taking while innovators may wonder what the norms are in the first place.

The findings relating to conflict and challenge do appear consistent with Kirton and deCiantis (1994) and Kirton and McCarthy (1988) and are described in more detail in Isaksen and Kaufmann (1990).

This presentation of the re-analysis of the original study provides more evidence and detail to support the findings that correlation analysis shows relatively little quantitative relationship between psychological climate (the SOQ) and KAI. We continue to find that discriminant function analysis does show that more adaptive and innovative individuals have significantly different SOQ scores on some of the SOQ dimensions. It is important to note that the results of the earlier analysis showed two dimensions were statistically significant while the revised data set showed differences on three dimensions.

Clapp and Kirton (1994) provided commentary on the 1990 study and laid out a number of broad issues requiring further explanation and investigation. Clapp and Kirton (1994) placed the investigation of preferred cognitive style and individual psychological climate within the level-style debate; interpreted the SOQ as designed to measure a single continuum of level of stagnation or progressiveness; and were unaware of the observed factor structure of the SOQ which lead them to make some incorrect assumptions. We will take each one of these issues in turn and provide more explanation and response.

The Level-Style Issue. Kirton (1976; 1994; 1999) has asserted the need to separate the variables of level or capacity from style or mode, just as we would divide the 'power of the engine' from the 'manner in which it is drawn.' Although there is tremendous potential for clarifying creativity research and practice by separating level and style, most of the inquiry and support for this distinction resides within the general area of person, with little work done in the areas of product, process and situation (Isaksen, 1995 & 2004; Isaksen & Dorval, 1993).

Although there is clear support for distinguishing KAI from IQ, we have found clear relationships between the KAI and preferences for learning, and levels of applying, specific kinds of creative problem-solving tools (Hurley, 1993; Schoonover, 1996; Wheeler, 1995), as well as graphic approaches to describing natural creative process (Pershyn, 1992). Certain of these preferences may provide for greater degrees of success or level of productivity depending on their fit to the task at hand or other situational factors.

In other words, some of the key variables outlined above may very well be conceptually and empirically distinct. Others may be inter-related, especially when considering the actual behavior of the individual in a particular context. This was the major challenge facing the aptitude-treatment line of research that attempted to understand the relationships between individual difference variables and student performance (Snow, 1992). Measures of psychological or organizational climate may not necessarily represent their domain "...from the viewpoint of either level (what or how well it is done) or style (how things are done)." (Clapp & Kirton, 1994, p. 130) The degree to which the level-style argument applies to crossing over from among the four main areas of people, processes, products and situations remains to be settled through future inquiry.

As it relates to the Isaksen and Kaufmann study, the results with this sample support a clear distinction between the two concepts of preferred cognitive style and observed psychological climate. The low number of correlations, and the small degree of variance accounted for by those that are significant, supports the empirical and conceptual distinction. Since no correlation accounts for as much as 3% overlap, any relationship between preferred cognitive style and psychological climate may be viewed as trivial. This finding provides preliminary evidence that rejects our initial (and exploratory) hypothesis that these two measures would correlate due to their combined predictive power on creative behavior. The findings tend to support a quantitative distinction between cognitive style and psychological climate. It should be noted that this was not a random sample and that further studies need to be done to generalize the results.

Conceptual Levels of Analysis. One of the major points of potential confusion when pursuing this line of inquiry is the need for similar levels of analysis. Individual psychological climate is the primary unit of analysis needed in order to enable the organizational measure of climate (Ekvall, 1996). It is the measure of individual psychological climate that is aggregated to obtain the organizational measure of the climate for creativity and change (James, James & Ashe, 1990). When analyzing the SOQ from an individual level of analysis, we are examining the concept of individual psychological climate.

he Isaksen and Kaufmann (1990) study attempted to keep the levels of analysis parallel by using individual psychological climate and individual preferred cognitive style. It was the relationship between these two concepts that was investigated. As the argument shifts to include organizational level of stagnation or progressiveness or cognitive climate, it has moved to the group/organizational level of analysis.

Attempting to do this in the context of this study would amount to taking a social-psychological variable (the organizational attribute of climate) and treating it as though it was an intra-personal variable. It can have the same confusing effect as taking an intra-personal (trait) variable like cognitive style and muddling it with another construct called cognitive climate which is asserted to be a social-psychological construct (Kirton & deCiantis, 1994). Keeping these levels of analysis clear will undoubtedly help us as the level-style line of inquiry continues.

Climate As an Intervening Variable. The Clapp and Kirton (1994) commentary includes an assertion that "...psychological climate can be used to describe organizations along a continuum concerned with an increasing level of innovation." (pg. 130) Again, psychological climate is the individual's perception of the pattern of behaviors that characterize life in the workplace, not the level of creativity of an organization. Similar to cognitive style, psychological climate is a variable that is at the individual level of analysis. The individual perceptions are aggregated to obtain a measure of organizational climate (James, 1982). Organizational climate is defined as an attribute of the organization, composed of patterns of behaviors that characterize life in the specific context of the workplace.

The SOQ is a measure composed of dimensions that describe the organization's climate for creativity and change. The measure has been shown to effectively discriminate between organizations that can be characterized as creatively productive and those described as stagnated (Ekvall, 1987 & 1996; Ekvall, et. al. 1983). The SOQ does not purport to be a direct measure of the level of creativity or success of the organization, but a more recent study (Ekvall & Ryhammar, 1998) does suggest a statistically significant relationship exists between most climate dimensions and creative achievements.

Organizational climate plays the role of an intervening variable that stems from resources of different kinds (people, buildings, know-how, products, concepts, funds, etc.) and has an effect on productivity, well-being, job satisfaction, and quality. As Ekvall (1996) indicated, "The climate has this moderating power because it influences organizational processes such as problem solving, decision making, communications, coordination, controlling, and psychological processes of learning, creating, motivation, and commitment" (p. 106).

From the perspective of the original study, climate is viewed as an intervening variable that affects the behavior of those within an organization. Ekvall (1991) also described the complex and interactive role climate plays in influencing behavior.

Clapp and Kirton (1994) suggest that the SOQ is a measure of general level of organizational success. We make no claims regarding the SOQ's ability to directly measure general organizational success. In fact, Ekvall and others are clear that many factors have an influence on the construct of climate for creativity. Rather than being seen as a measure of a construct falling on a single continuum, the SOQ actually measures a family of independent dimensions aimed at understanding the patterns of behaviors within a particular work group that support creativity and change.

Organizational climate describes the atmosphere of the interpersonal functioning of the people within a given working environment. The composition of the dynamics of the individuals within an environment creates a climate in which they interact

(Schneider, 1987b). Clapp (1991) described organizational climate as "...organizational attributes and behavior that are outside of any individual in the organization." (p. 101). Psychological climate is composed of the perceptions the individual makes of their climate and may dictate appropriate behaviors for that individual within the environment (Schneider & Reichers, 1983; Koys & DeCotiis, 1991).

Therefore, factors contributing to the way individuals perceive their environments, such as their psychological characteristics, help to create the climate in which the individuals' perceptions occur. One such psychological characteristic may be the individual's cognitive style.

Challenge and Conflict as Independent Dimensions. Finally, Clapp and Kirton (1994) indicated that "...challenge and conflict appear to be semantic opposites..." (p. 133). They recommended combining them into a single bipolar measure because they appeared to be opposites and because these were the two dimensions which were the optimal predictor variables reported in the first study. Their suggestion would be a convenient way to handle the fact that some dimensions were significantly discriminated and others (pure from style relationship) were not.

It is not that simple. The observed factor structure of the SOQ clearly indicates that the challenge and conflict dimensions are independent of one another (Cabra, 1996; Isaksen, et al., 1995; Isaksen, Lauer & Ekvall, 1999; Lauer, 1994). Instead, items on the trust dimension sometimes load negatively with the conflict dimension (occasionally, items on the conflict dimension will load negatively on the trust dimension) depending on the size and the nature of the sample.

Since the dimensions of challenge and conflict are factorially independent and since they are not a direct measure of organizational productivity, it would not be appropriate to place them on a single continuum. Rather, they should be seen as two dimensions (among others) that characterize the climate for creativity and change in the organization.

Although these comments are in direct response to Clapp and Kirton (1994), their general interpretation and questions provided an opportunity to explore other areas for future research and inquiry. The study of both cognitive style and organizational climate has recently captured the international attention of organizations striving to create more productive and competitive working environments. By understanding the elements that affect the people within these organizations, actions may be taken to improve the work environment in light of both environmental (social and climatic) and psychological (intra-individual) factors. The suggestions and comments offered by Clapp and Kirton (1994) on our previous inquiry have stimulated this particular response and we hope to continue this line of research to offer improved responses to the issues they raise. Improving our understanding of the relationship between cognitive style and psychological climate will assist the future work of both scholars and practitioners.

Study 2: First Use of VIEW

Problem-Solving Style and Individual Psychological Climate. The next study focused on a new measure developed by Selby, Treffinger, Isaksen and Lauer (2004) called VIEW: An Assessment of Problem-Solving Style and the results on an individual level of analysis from the SOQ (Isaksen, 2009). The VIEW assesses problem-solving style defined as: consistent individual differences in the ways people prefer to plan and carry out generating and focusing activities, in order to gain clarity, produce ideas, and prepare for action.

VIEW assesses individual preferences on three dimensions of problem-solving style. The scores yielded by the first dimension provide an overall indication of the person's perceived preferences along a continuum described as Orientation to Change (OC), with two general styles: the Explorer and the Developer. The second dimension involves one's preferred manner of Processing (MP), with two styles: External and Internal.

The third dimension of VIEW deals with one's preferred ways of Deciding (WD), in which two styles are defined: People-focused and Task-focused.

The items comprising the OC dimension represent cognitive aspects of problem-solving style. This scale addresses the questions: "How do I prefer to deal with boundaries and parameters?" "How do I feel about and react to structure?" and "How do I prefer to respond to novel challenges?"

Scores below the mean on this dimension indicate the Explorer style. In ordinary use, an "explorer" is an individual who thrives on venturing in uncharted directions, seeks to break new ground, and follows adventurous or promising new possibilities wherever they may lead. Explorers enjoy initiating a broad range of tasks and thrive on new, ill-defined, and ambiguous situations and challenges. Explorers seek to create many unusual and original options that, if developed and refined, might provide the foundation for productive new directions. They enjoy seeing unusual possibilities, patterns, and relationships. Other people may find their highly novel ideas difficult to understand or initially to "buy into." Explorers tend to embrace new experience and to "plunge" right into novel situations. They do not fear (and may seem to thrive upon) risk and uncertainty, and often improvise their planning as the situation unfolds, becoming so involved in the excitement of new, leading edge ideas that concerns about efficiency and practicality are, at times, forgotten. Explorers may continue to consider new ideas about a project, even after closure has been reached, or they may abandon a project before reaching any closure, so they can pursue new challenges. They often find plans, procedures, and structures that are imposed on them to be confining and limiting.

Scores above the mean on the OC scale indicate the Developer style. In ordinary use, a "developer" is an individual who brings tasks to fulfillment, who begins with the basic elements or ingredients and then organizes, synthesizes, refines, and enhances them, forming or shaping them into a more complete, functional, useful condition or outcome. Developers are concerned with practical applications and the reality of the task, and they use their creative and critical thinking in ways that are clearly

recognized by others as being helpful and valuable. They prefer problems and solutions that are within the framework of their present experience, seeking change that is incremental, practical, and easily assimilated by the current reality. Developers prefer finding a small number of workable possibilities and guiding them to successful implementation. They tend to focus on bringing one task to closure before taking on a new challenge. Others often see Developers as persistent, careful, practical, methodical, well organized, and as seeking to minimize risk and uncertainty. They are comfortable with plans, details, structure, and the guidance of authority figures. They find structure and the guidance of authority helpful, or even enabling, in moving tasks or projects forward in an efficient, deliberate manner.

A second dimension of VIEW describes one's preferred Manner of Processing (MP) information during problem solving. This scale addresses the questions: "How do I prefer to manage information and its flow when problem solving?" "When do I share my thinking?" and "Does interacting with others build or spend energy?"

Scores below the mean indicate a preference for an "External" style of processing. Individuals who exhibit a well-developed preference for this style draw their energy from interaction with others, discussing possibilities, and building from the ideas of others. They prefer physical engagement with the environment. When learning new and difficult material those with an External style preference clarify their ideas and understandings through discussion. They find the input of authorities helpful as part of their active discussion.

They are not bothered by noise in the study area, approach learning in several ways, and often find that physical mobility enhances their learning, thinking, and problem solving. When solving problems, they seek a great deal of input from others before reaching closure. "Externals" tend to be seen by others as good team members and often appear full of energy. Preferring action to reflection, they may appear to rush into things before others are ready to proceed.

Scores above the mean reflect a preference for an “Internal” style of processing. Those with a well-developed Internal style look first reflectively to their own inner resources and draw energy from their reflection. They prefer to consider ideas on their own before sharing them with others. They embark on action only after giving it careful consideration. People with an Internal preference emphasize quiet reflection and processing information at their own pace. They tend to become engrossed in inner events, ideas, and concepts. They prefer learning privately, working at least initially without the help of peers or authority figures. They may seem quiet and might be perceived by others as pensive or withdrawn.

The third dimension of VIEW involves preferences for Deciding (WD) about options or possibilities. This scale addresses such questions as: “What factors get first priority when I focus or decide?” “Where do I start?” and “How do I make trade-offs?” Scores on this scale indicate whether one’s primary focus in decision-making is on “People” or “Task.”

Individuals with scores below the mean tend to focus on the People style as their primary emphasis when deciding. They consider first the impact of choices and decisions on people’s feelings and support, and on the need for harmony and positive relationships. They prefer to be emotionally involved when setting priorities. They are often seen as warm, friendly and caring. They are often quick to become aware of, and to respond to, the needs of others. They seek solutions or decisions that all concerned can “buy into.”

Scores above the mean indicate a focus on the Task style. Those with this focus tend to look first at choices and decisions that are logical, sensible and can be justified objectively. They prefer making judgments that are impersonal, based on well-reasoned conclusions. Individuals with a Task style of decision making seek mastery of content or information to help them arrive at the “best solution” or response, or at a solution they can readily defend or justify. They may stress the need for staying cool and free from emotion, while seeking clarity, precision, and logical order.

Data from both VIEW and the SOQ were available from 144 subjects on the CPSB database. Descriptive statistics for both measures are presented in Table 129. Descriptive statistics broken down by gender are presented in Table 130. Nineteen subjects did not report their gender.

Since the OC dimension of VIEW is correlated with the KAI, and VIEW contains two additional dimensions, we wanted to re-examine the potential relationship between problem solving style and individual perceptions of psychological climate.

Table 129
Descriptive Statistics VIEW/SOQ

SOQ Dimension	N	Minimum	Maximum	Mean	Std. Deviation
Challenge/Involvement	144	71	300	211.51	48.710
Freedom	144	17	267	166.09	49.685
Trust/Openness	144	80	280	181.67	47.922
Idea-Time	144	0	267	129.63	59.244
Playfulness/Humor	144	17	300	179.05	60.359
Conflict	144	0	267	90.74	61.317
Idea-Support	144	20	300	188.19	55.943
Debate	144	33	300	200.93	55.005
Risk-Taking	144	20	280	141.53	54.866
VIEW Dimension					
Orientation To Change	144	42	108	72.40	13.912
Manner of Processing	144	12	45	26.09	7.449
Ways Of Deciding	144	20	55	36.11	7.825

Table 130
Descriptive Statistics View/SOQ for Males and Females

SOQ Dimension	Male (N=82)			Female (N=43)		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Challenge/Involvement	213.07	71	300	213.62	129	300
Freedom	167.68	17	267	160.47	17	267
Trust/Openness	186.83	80	280	178.14	80	280
Idea-Time	134.15	0	267	116.28	0	267
Playfulness/Humor	178.86	17	300	187.60	33	300
Conflict	82.72	0	267	105.81	0	250
Idea-Support	190.73	20	300	182.79	80	280
Debate	208.54	50	300	190.31	33	300
Risk-Taking	146.10	20	280	130.70	40	260
VIEW Dimension						
Orientation To Change	73.49	42	108	70.95	43	101
Manner of Processing	26.20	12	44	26.91	12	45
Ways Of Deciding	36.72	20	55	35.02	22	49

Scores on the nine dimensions of the SOQ and the three dimensions of VIEW were subjected to correlation analysis to examine the relationship between VIEW and SOQ at the individual level of analysis. These results are presented in Table 131. Only two of a possible 27 correlations were significant, and both were negligible. These findings were consistent with the previous research.

Table 131
VIEW/SOQ Correlations

Dimension		Orientation to Change	Manner of Processing	Ways of Deciding
Challenge/Involvement	Pearson Correlation	-.206	-.123	-.135
	Significance	.013	.142	.107
Freedom	Pearson Correlation	-.088	-.096	-.101
	Significance	.297	.253	.228
Trust/Openness	Pearson Correlation	.079	-.002	-.077
	Significance	.346	.981	.362
Idea-Time	Pearson Correlation	-.030	-.031	-.019
	Significance	.718	.711	.819
Playfulness/Humor	Pearson Correlation	-.019	-.085	-.147
	Significance	.821	.308	.080
Conflict	Pearson Correlation	.000	-.028	.029
	Significance	.998	.743	.733
Idea-Support	Pearson Correlation	-.069	-.179	-.112
	Significance	.411	.031	.183
Debate	Pearson Correlation	-.050	-.147	-.073
	Significance	.549	.078	.388
Risk-Taking	Pearson Correlation	-.111	-.045	-.087
	Significance	.187	.594	.301

The next step was to sort two sub-groups that were stronger or more distinct in their problem-solving preferences. Those scoring within one standard deviation from the observed mean were removed from the full sample of 144 subjects, leaving 48 subjects with a stronger Explorer preference and 46 subjects with a stronger Developer preference. The descriptive statistics for these two sub-groups are presented in Table 132.

Table 132
Descriptive Statistics – Stronger Explorer/Stronger Developer

Dimension	Stronger Explorer (n=48)		Stronger Developer (n=46)	
	Mean	Std. Deviation	Mean	Std. Deviation
Challenge/Involvement	215.77	41.492	200.62	51.899
Freedom	170.49	42.001	155.43	60.457
Trust/Openness	175.42	49.377	185.22	48.887
Idea-Time	126.39	62.155	120.65	69.138
Playfulness/Humor	182.29	55.267	180.80	67.400
Conflict	94.10	59.399	95.65	68.802
Idea-Support	192.92	51.775	181.74	57.939
Debate	197.57	52.591	193.12	57.260
Risk-Taking	138.75	55.414	128.26	53.263

Once these two groups were identified, they were coded in order to conduct a discriminant function analysis. The results of this analysis are presented in Table 133. Even with these stronger preferences identified for the OC dimension of VIEW, no significant differences were found for the two groups. This indicates a rather clear separation of the constructs of individual psychological climate and an Orientation to Change problem-solving style.

Table 133
Discriminant Function – Stronger Explorer/Stronger Developer
Tests of Equality of Group Means (Orientation To Change)

	Wilks' Lambda	F	df1	df2	Sig.
Challenge/Involvement	0.974	2.452	1	92	0.121
Freedom	0.979	1.988	1	92	0.162
Trust/Openness	0.990	0.934	1	92	0.336
Idea-Time	0.998	0.184	1	92	0.669
Playfulness/Humor	1.000	0.014	1	92	0.906
Conflict	1.000	0.012	1	92	0.913
Idea-Support	0.990	0.975	1	92	0.326
Debate	0.998	0.157	1	92	0.692
Risk-Taking	0.991	0.874	1	92	0.352

63.8% of original grouped cases correctly classified

The same procedure was followed for the Manner of Processing dimension of VIEW. Again, those scoring within one standard deviation from the observed mean were removed from the original sample of 144 subjects. This procedure left 54 subjects with a strong External preference and 44 subjects with a strong Internal preference. The descriptive statistics for both these groups are presented in Table 134.

Table 134
Descriptive Statistics – Stronger Internal/Stronger External

Dimension	Stronger External (n=54)		Stronger Internal (n=44)	
	Mean	Std. Deviation	Mean	Std. Deviation
Challenge/Involvement	213.49	51.576	201.95	52.157
Freedom	169.14	53.042	158.71	55.509
Trust/Openness	181.11	41.558	180.00	52.296
Idea-Time	127.78	62.529	129.17	56.505
Playfulness/Humor	187.04	61.911	175.00	58.788
Conflict	92.59	62.249	82.58	54.625
Idea-Support	196.67	49.716	176.36	59.654
Debate	203.09	50.891	184.09	59.926
Risk-Taking	143.33	58.761	139.55	57.302

Once these two groups were identified, they were coded and subjected to discriminant function analysis. The results from this analysis are presented in Table 135. Once again, with a reasonably high degree of classification, no significant differences were found between those with stronger Manner of Processing preferences and any of the nine climate dimensions.

Table 135
Discriminant Function – Stronger Internal/Stronger External
Tests of Equality of Group Means (Manner Of Processing)

	Wilks' Lambda	F	df1	df2	Sig.
Challenge/Involvement	0.988	1.198	1	96	0.276
Freedom	0.991	0.904	1	96	0.344
Trust/Openness	1.000	0.014	1	96	0.907
Idea-Time	1.000	0.013	1	96	0.908
Playfulness/Humor	0.990	0.950	1	96	0.332
Conflict	0.993	0.709	1	96	0.402
Idea-Support	0.966	3.378	1	96	0.069
Debate	0.971	2.884	1	96	0.093
Risk-Taking	0.999	0.103	1	96	0.749

67% of original grouped cases correctly classified

The same procedure was followed for the Ways of Deciding dimension of VIEW. The descriptive statistics for these two stronger-style groups are presented in Table 136.

Table 136
Descriptive Statistics – Stronger Person/Stronger Task

Dimension	Stronger Person (n=37)		Stronger Task (n=53)	
	Mean	Std. Deviation	Mean	Std. Deviation
Challenge/Involvement	224.32	41.631	209.97	56.284
Freedom	172.52	41.614	170.13	54.827
Trust/Openness	185.95	54.337	180.75	45.058
Idea-Time	127.48	60.120	132.08	56.221
Playfulness/Humor	178.38	58.117	170.75	60.439
Conflict	89.64	60.903	85.85	63.750
Idea-Support	195.14	59.518	186.79	50.068
Debate	205.41	60.738	197.80	47.371
Risk-Taking	150.27	54.288	140.00	55.609

These two groups were then subjected to discriminant function analysis and the results are presented in Table 137. For the Ways Of Deciding dimension of VIEW we find no significant differences.

Table 137
Discriminant Function – Stronger Person/Stronger Task
Tests of Equality of Group Means (Ways Of Deciding)

	Wilks' Lambda	F	df1	df2	Sig.
Challenge/Involvement	0.981	1.739	1	88	0.191
Freedom	0.999	0.051	1	88	0.822
Trust/Openness	0.997	0.244	1	88	0.623
Idea-Time	0.998	0.135	1	88	0.714
Playfulness/Humor	0.996	0.346	1	88	0.558
Conflict	0.999	0.079	1	88	0.779
Idea-Support	0.994	0.518	1	88	0.474
Debate	0.995	0.454	1	88	0.502
Risk-Taking	0.991	0.758	1	88	0.386

60.5% of original grouped cases correctly classified

There are many other ways to examine individual differences beyond psychological type, cognitive style or problem-solving style. One conclusion that can be drawn from this series of studies is that the two concepts of style and climate are fairly and clearly distinct. From the standpoint of concurrent validation, we seek relationships with other variables that should, in principle, relate to the one under consideration. In this case, we have been examining the relationship between individual psychological climate and a variety of measure of style or personal orientation. We have treated these constructs as distinct in our previous research and practice. Thus far, the evidence supports this distinction.

Study 3: Replication of SOQ and VIEW

A replication of the previous study was conducted, but included the best and worst-case short form results for the nine dimensions of the SOQ (Isaksen & Aerts, 2011). The previous study used data from the web-based version of the SOQ in which the respondents were reporting their observations and perceptions of the actual climate. This study explored problem-solving style differences for best and worst-case climates.

Purpose and Sample. This study included 174 individuals who had completed both the short form best and worst-case SOQ and VIEW: An Assessment of Problem Solving Style. Respondents included members of organizations that contracted the Creative Problem-Solving Group (CPSB) for training in Creative Problem Solving (n = 104) and 70 were participants in educational courses.

The sample included 87 males, 86 females, and 1 individual who declined to indicate gender. The mean age of the respondents (n = 162) who reported their age was 34.51 years with a range of 17 to 68 years. From the 104 respondents coming from an organization, 51% were directors, CEO's, board members or senior managers while 49% consisted of a group of mixed professionals. From a total of 174 participants, 70 came from an educational institution, 34% were graduate students enrolled in master's level business courses, and 66% were undergraduates. The graduate students were enrolled in an MBA program at Wilkes University (Pennsylvania) and one Norwegian management university, and the undergraduates all came from business classes at the University of Great Falls (Montana).

The data collected from the directors, CEO's, board members and senior managers came from 3 different events. One was done with one of the Big Four accounting firms. Another took place with one of the largest nonprofit providers of education, training, and career services, and the last one was done at a leadership conference hosted by the University of Great Falls. Table 138 presents the descriptive statistics for VIEW.

Table 138
Descriptive Statistics VIEW

VIEW Dimension	N	Min.	Max.	Mean	Std. Deviation
Orientation To Change	174	23	120	73	15.44
Manner Of Processing	174	8	55	29	9.34
Ways Of Deciding	174	12	55	34	8.54

These results indicate that the observed mean (73) on OC is nearing the theoretical mean while the means for MP (29) and WD (34) are different from the theoretical means, but similar to the observed mean as reported in VIEW's technical manual (Selby, Treffinger, & Isaksen, 2007).

The visual distribution of each VIEW dimension is presented below.

Table 139
VIEW Distribution for Orientation to Change

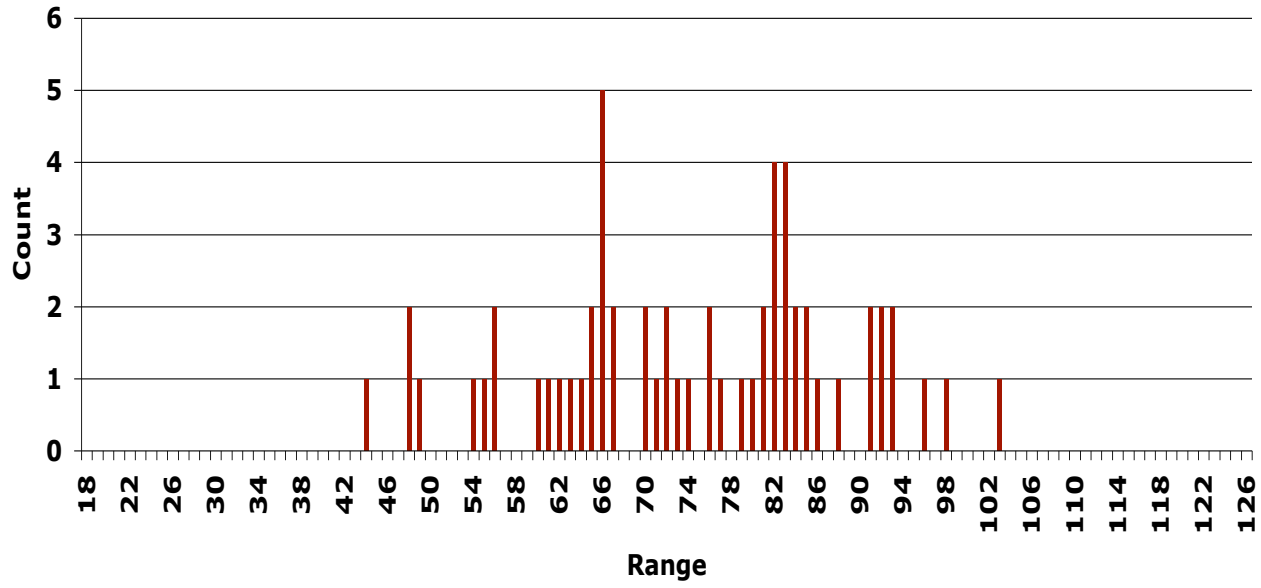


Table 140
VIEW Distribution for Manner of Processing

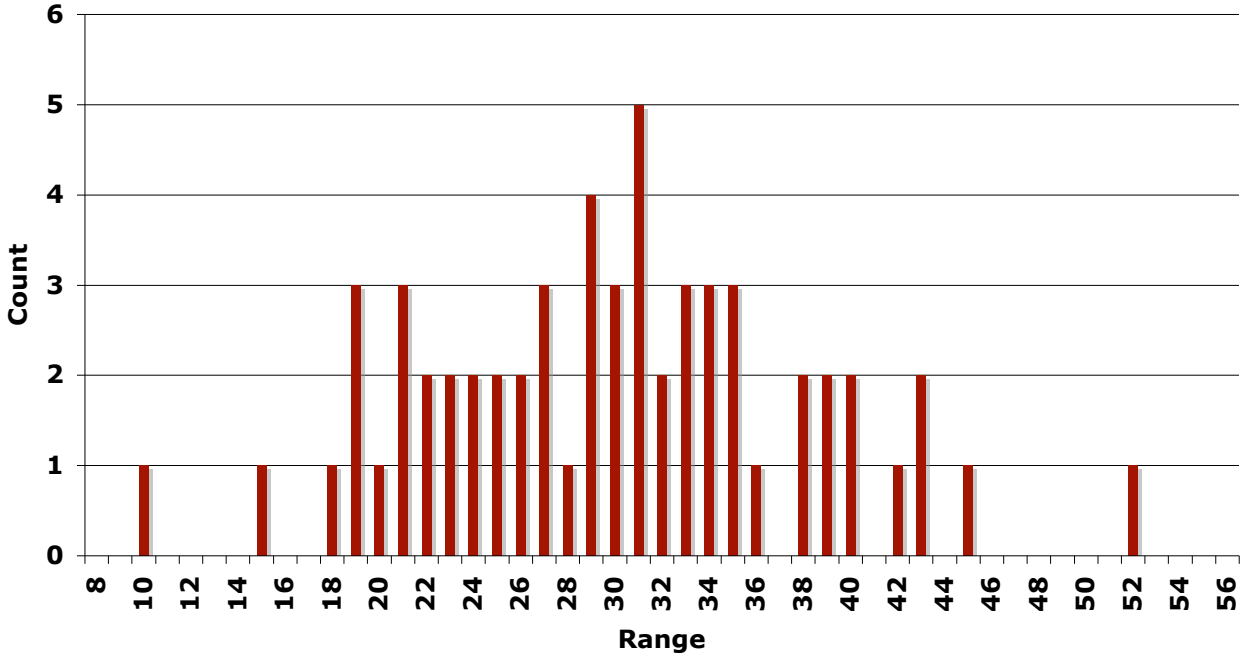
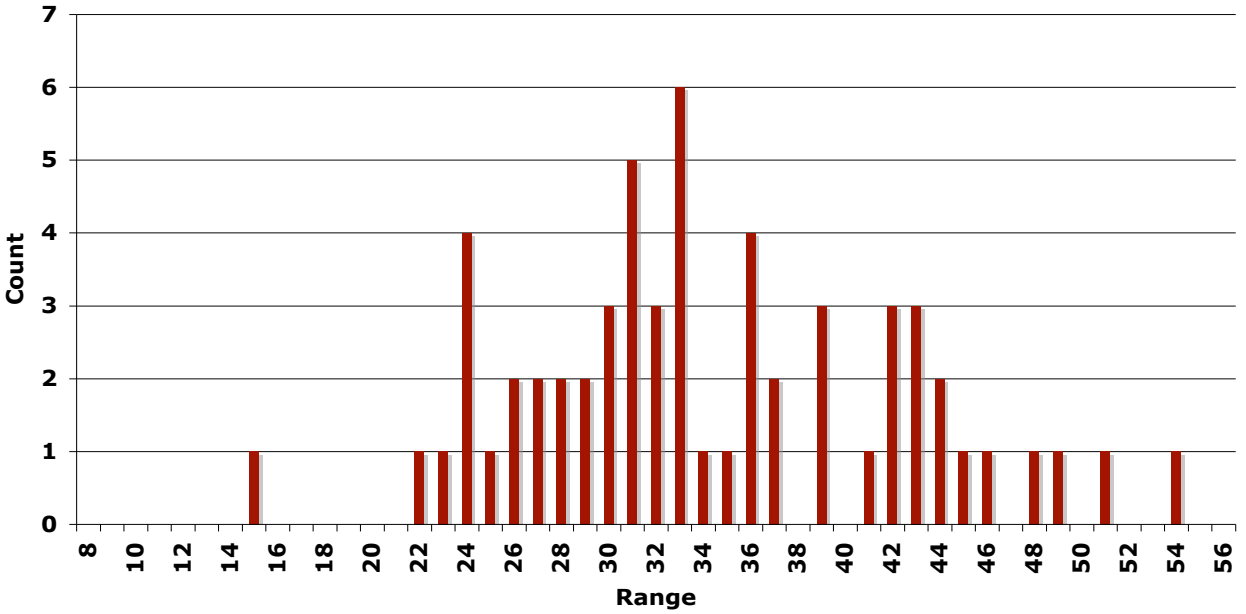


Table 141
View Distribution for Ways of Deciding



Results and Discussion. Correlations were computed to determine the degree of relationship between VIEW scores on all three dimensions and both the best and worst-case results on the SOQ. These results can be found in Table 142 and Table 143.

Table 142
Correlations: SOQ and VIEW in the Best-Case Situation

SOQ Dimension	Orientation to Change	Manner of Processing	Ways of Deciding
Challenge/Involvement	-.10	-.00	-.02
Freedom	-.22(*)	-.03	.01
Trust/Openness	-.02	-.12	.06
Idea-Time	-.06	-.03	.11
Playfulness/Humor	.01	-.09	-.09
Conflict	-.13	-.04	-.07
Idea-Support	-.10	.00	-.02
Debate	-.06	-.01	.05
Risk-Taking	-.13	.12	.07

* Correlation is significant at the 0.01 level

There were two significant correlations. Explorers showed a correlation with Freedom in their best-case situation. Respondents with a Person style preference showed correlation with Debate in their worst-case climate.

Table 143
Correlations: SOQ and VIEW in the Worst-Case Situation

SOQ Dimension	Orientation to Change	Manner of Processing	Ways of Deciding
Challenge/Involvement	.02	.06	-.04
Freedom	.05	.07	-.11
Trust/Openness	-.01	-.04	-.04
Idea-Time	.08	.06	-.04
Playfulness/Humor	.05	.03	-.14
Conflict	-.06	-.01	-.01
Idea-Support	.09	.02	-.07
Debate	.07	.07	-.16(*)
Risk-Taking	.14	.06	-.12

* Correlation is significant at the 0.05 level

Only two significant correlations were found out of 54 possible relationships. These results are similar to the previous studies examining style and climate. Generally, few significant correlations are found, lending support to the assertion that style and climate are relatively distinct concepts.

Since this exploratory study applied a unique approach to assessing climate, further analysis was conducted to determine if there were significant differences between the styles in every VIEW dimension and the SOQ dimensions in the best-case and worst-case situation. Multivariate Analysis of Variance (MANOVA) and Analysis of Variance (ANOVA) were computed for all three VIEW dimensions on the complete sample to determine if there were significant differences.

The MANOVA did not yield an overall significant interaction for the OC dimension of VIEW with the best and worst-case creative climate (Wilks' Λ = .891, $F(18,155) = 1.06$, $p>.05$). ANOVA's were computed to look for significant differences within each of the nine dimensions.

Tables 144 and 145 show the Means for the OC dimension of VIEW and the scores on the nine SOQ climate dimensions in the best-case and worst-case situations.

Table 144
Means for OC and SOQ: Best-case situation

SOQ Dimension	Best-case Explorer a	Best-case Developer b	Difference
Challenge/Involvement	246.11	241.67	4.44
Freedom	225.00	205.95	19.05
Trust/Openness	235.00	233.69	1.31
Idea-Time	213.61	204.17	9.44
Playfulness/Humor	248.61	250.00	-1.39
Conflict	62.22	47.62	14.60
Idea-Support	233.89	225.60	8.29
Debate	216.94	205.54	11.41
Risk-Taking	214.17	207.14	7.02

n for a = 84 n for b= 90

Table 145
Means for OC and SOQ: Worst-Case situation

SOQ Dimension	Worst-case Explorer a	Worst-case Developer b	Difference
Challenge/Involvement	101.67	109.52	-7.86
Freedom	103.89	106.55	-2.66
Trust/Openness	83.33	87.50	-4.17
Idea-Time	71.11	77.98	-6.87
Playfulness/Humor	86.67	98.81	-12.14
Conflict	172.22	151.19	21.03
Idea-Support	72.22	80.36	-8.13
Debate	83.89	97.02	-13.13
Risk-Taking	70.22	88.69	-18.47

n for a = 84 n for b= 90

Table 146 presents the results of the ANOVA on the differences on the OC dimension of VIEW and the best and worst-case climate scores. Two dimensions reached the .05 level of significance: Freedom, in the best-case climate; and Risk-Taking in the worst-case situation.

Table 146
ANOVA on SOQ Dimensions and OC

SOQ Dimension	Best-Case		Worst-Case	
	F	Sig.	F	Sig.
Challenge/Involvement	0.36	.549	0.59	.444
Freedom	4.57	.034	0.06	.809
Trust/Openness	0.02	.890	0.21	.649
Idea-Time	0.95	.331	0.75	.389
Playfulness/Humor	0.30	.869	1.32	.252
Conflict	3.31	.070	2.31	.130
Idea-Support	0.89	.346	1.05	.307
Debate	1.58	.210	2.00	.160
Risk-Taking	0.47	.494	4.16	.043

* df = 173

Explorers report significantly more Freedom in their best-case situation than Developers. Explorers see rules and structure as limiting and confining and seem unconcerned with deadlines and the need for closure. Explorers like to challenge authority and prefer to work away from direct authority. Developers, on the other hand, prefer to work in a detailed, well-organized, and carefully structured environment with sources of authority nearby.

Developers perceive more Risk-Taking in their worst-case climates than Explorers. Since an Explorer seeks to break new ground, thrives on venturing in uncharted directions, and follows interesting possibilities wherever they might lead, it is only

logical they feel the need and possibility to take more risks. Developers are more conventional in this regard; they like to hold on to established values and ideas. They will try to improve these ideas within certain well-defined boundaries.

The next dimension of VIEW, Manner of Processing (MP), was examined by applying MANOVA, and no significant interaction for this dimension was found for the best and worst-case climates (Wilks' Λ = .922, $F(18,155) = 0.73$, $p>.05$). ANOVA's were computed to look for significant differences within each dimension.

Table 147 presents the means for the MP dimension of VIEW and the scores on the nine SOQ climate dimensions in the best-case situation.

Table 147
Means for MP and SOQ: Best-Case Situation

SOQ Dimension	Best-case External a	Best-case Internal b	Difference
Challenge/Involvement	241.76	246.39	-4.63
Freedom	217.58	213.86	3.73
Trust/Openness	239.56	228.67	10.89
Idea-Time	211.81	206.02	5.79
Playfulness/Humor	248.08	250.60	-2.53
Conflict	55.49	54.82	0.68
Idea-Support	234.07	225.30	8.76
Debate	212.91	209.82	3.09
Risk-Taking	205.77	216.27	-10.50

n for a = 117 n for b = 57

Table 148 presents the means for the MP dimension of VIEW and the scores on the nine SOQ climate dimensions in the worst-case situation.

Table 148
Means for MP and SOQ: Worst-Case Situation

SOQ Dimension	Worst-case External a	Worst-case Internal b	Difference
Challenge/Involvement	99.45	112.05	-12.60
Freedom	103.30	107.23	-3.93
Trust/Openness	87.36	83.13	4.23
Idea-Time	72.53	76.51	-3.98
Playfulness/Humor	94.51	90.36	4.14
Conflict	162.09	162.05	0.04
Idea-Support	78.57	73.49	5.08
Debate	87.36	93.37	-6.01
Risk-Taking	77.14	81.33	-4.18

n for a = 117 n for b = 57

Table 149 displays the results of the ANOVA on differences in the MP dimension of VIEW against the nine SOQ climate dimensions for both the best-case and worst-case situations.

Table 149
ANOVA on SOQ Dimensions and MP

SOQ Dimension	Best-Case		Worst-Case	
	F	Sig.	F	Sig.
Challenge/Involvement	0.39	.533	1.52	.220
Freedom	0.17	.680	0.13	.721
Trust/Openness	1.34	.249	0.21	.644
Idea-Time	0.36	.552	0.25	.618
Playfulness/Humor	0.09	.764	0.15	.696
Conflict	0.01	.934	0.00	.998
Idea-Support	1.00	.320	0.41	.524
Debate	0.12	.735	0.41	.521
Risk-Taking	1.05	.306	0.21	.649

* df = 173

No significant differences were found for Manner of Processing compared with the SOQ dimensions.

A MANOVA was conducted on the third dimension of VIEW, Ways of Deciding (WD) and no significant interaction for this dimension of VIEW with the best and worst-case climates was found (Wilks' Λ = .206, F(18,155) = 1.28 p>.05). ANOVA's were computed to look for significant differences within each dimension. Table 150 reports the means for the WD dimension of VIEW and the scores on the nine SOQ climate dimensions in the best-case climate.

Table 150
Means for WD and SOQ: Best-Case Situation

SOQ Dimension	Best-case Person a	Best-case Task b	Difference
Challenge/Involvement	242.47	245.68	-3.21
Freedom	210.75	221.60	-10.85
Trust/Openness	226.13	243.83	-17.70
Idea-Time	203.76	215.12	-11.36
Playfulness/Humor	250.00	248.46	1.54
Conflict	54.84	55.56	-0.72
Idea-Support	228.49	231.48	-2.99
Debate	204.84	219.01	-14.17
Risk-Taking	201.61	221.30	-19.68
	n for a = 117	n for b = 57	

Table 151 reports the means for the WD dimension of VIEW and the scores on the nine SOQ climate dimensions in the worst-case climate.

Table 151
Means for WD and SOQ: Worst-Case Situation

SOQ Dimension	Worst-case Person a	Worst-case Task b	Difference
Challenge/Involvement	105.38	105.56	-0.18
Freedom	116.67	91.98	24.69
Trust/Openness	87.63	82.72	4.92
Idea-Time	79.57	68.52	11.05
Playfulness/Humor	102.15	81.48	20.67
Conflict	169.89	153.09	16.81
Idea-Support	81.72	69.75	11.97
Debate	100.00	79.01	20.99
Risk-Taking	84.95	72.47	12.48

n for a = 117 n for b = 57

Table 152 shows the result of the ANOVA on differences in the WD dimension of VIEW. The results indicate two dimensions with a significant difference. Both of them were found in the worst-case situation: one on Freedom, and another on Debate.

Table 152
ANOVA on SOQ Dimensions and WD

SOQ Dimension	Best-case		Worst-case	
	F	Sig.	F	Sig.
Challenge/Involvement	0.19	.667	0.00	.986
Freedom	1.45	.230	5.17	.024
Trust/Openness	3.58	.060	0.29	.592
Idea-Time	1.37	.243	1.94	.165
Playfulness/Humor	0.03	.855	3.87	.051
Conflict	0.01	.930	1.46	.228
Idea-Support	0.12	.735	2.28	.133
Debate	2.45	.119	5.17	.024
Risk-Taking	3.75	.054	1.87	.174

* df = 173

People-oriented deciding styles report significantly more Freedom in their worst-case climates. Freedom has to do with perceived degrees of autonomy in the climate. When there are high degrees of autonomy displayed in the workplace, people can make decisions and take initiative on their own.

This would make perfect sense to the Task-oriented decider. The People-oriented decider would prefer that people worked together to gain agreement and consensus on decisions and initiatives, before taking action.

The results also indicate that People-oriented styles perceived more Debate in their worst-case climates. Climates containing high levels of Debate include more tension about different ideas and perspectives. People-oriented deciders are more likely to be sensitive to tension whether it is about ideas or people. Task-oriented deciders are more likely to be able to separate idea tension from personal tension. Not so for the People-oriented deciders.

There are also two other dimensions approaching significance: Risk-Taking in the best-case situation and Playfulness/Humor in the worst-case climates. Task-oriented deciders perceive more Risk-Taking in their best-case climates than do People-oriented deciders. Since Task-oriented deciders perceive less personal tension and desire closure, they are likely to make decisions more quickly in the face of ambiguity. Person-orientated deciders see more Playfulness/Humor than Task-orientated styles do. Since they are more observant of both idea and people-oriented tension, it seems likely that they would also see more of the release of this tension, even in their worst-case climates.

In conclusion, four significant differences were found using the entire sample and deploying ANOVA's to examine all three dimensions of VIEW and both the best and worst-case climate scores. The few significant differences that were found are entirely consistent with the VIEW theory and measure.

The constructs and assessments applied of climate and style appear to be rather independent. On the basis of these studies, there appears to be little overlap of these two main concepts. The relationships that are found seem to be explainable and could be helpful in practice.

Discriminating levels of perceived support for creativity

This study was designed to examine the nature of the relationship between individuals' perceptions of support for their personal creativity and their results on the nine dimension scores of the SOQ. The specific research interest was in determining whether a significant relationship existed between the individuals perception of the supportiveness of their own immediate work environment for creativity and each of the nine dimensions of the SOQ. This study was published in its entirety in Isaksen and Lauer (2001).

Purpose and sample. The study used data from 1,830 individuals. Of these 1,469 were members of organizations that contracted for training courses in Creative Problem

Solving (CPS) with the Creative Problem-Solving Group (CPSB), while 361 were participants in educational and organizational research samples.

Regarding gender, 54.8% were male, 45.2% were female. The mean age of those respondents (n = 977) who reported their age was 35.3 years with a range of 17 to 64 years. The educational level of the sample, reported by 762 subjects, was spread over the following groups: completed high school (n=21), some college education (n = 134), bachelor's degree (n = 249), some graduate education (n=22), master's degree (n = 177), and doctoral degrees (n = 159).

Participants came from a wide range of organizational levels and functions. The majority of participants included in this study came from six organizations (n = 1,469), while the remaining subjects were undergraduate students who had previously attended courses on creativity (n = 195), attended educational conferences (n = 122), or attended five-day creative problem-solving courses (n = 44). Participants represented a variety of organizations, namely: 74% from Business/Goods Industries (n = 1354), 3% from Education (n = 55), .6% from the Government or Service sector (n = 9), 10.7% were college students (n = 196), and 11.8% did not specify their type of organization (n = 216).

The majority of the participants in the Business/Goods Industry category came from two large international organizations. Several courses were conducted at a petroleum company, accounting for a total of 755 respondents, or 41.3% of the total sample. Programs conducted for a consumer products manufacturer provided another 528 subjects, or 28.9 % of the total sample.

The version used in this study contained five items for each of the nine SOQ dimensions and the omnibus question cited later in this section. Of the 46 items, 22 items are reverse scored to control for response bias. The items are framed in such a manner that they ask the respondent to be an objective observer of the environment in which he/she is working. Respondents answer the items on a 4-point scale in which 0 = Not at all applicable, 1 = Applicable to some extent, 2 = Fairly applicable, 3 = Applicable to a high degree. The overall scores for each dimension are calculated

by taking the mean of the participant's response for each dimension and multiplying the result by 100. All dimensions therefore, have a theoretical range from 0 to 300. This procedure allows for ease of comparison across dimensions. The coefficient alphas for the SOQ's nine theory-based factors obtained from this sample were as follows: Challenge/Involvement, .81; Freedom, .69; Conflict, .72; Idea-Support, .83; Playfulness/Humor, .78; Debate, .82; Trust/Openness, .71; Risk-Taking, .52; and Idea-Time, .81.

Studies of validity have utilized demographic grouping and/or self-report responses as a means of classifying respondents into meaningful groupings (Litwin & Stringer, 1968; Sackett & Larson, 1990; Taylor & Gryskiewicz, 1993). In this study an omnibus question was used to classify respondents into meaningful groups. The question was phrased: "I feel the immediate work environment is supportive of my personal creativity." The respondents were divided into four groups depending on their responses to this question. The group of participants who had scored their environment as "not supportive" was labeled Not Supportive (n = 201). Those in the second group found their immediate work environment conducive to their creativity "to some extent" and are labeled To Some Extent (n = 609). The third group consisted of respondents who had answered the omnibus question with "fairly applicable" and was labeled Fairly Supportive (n = 702). Finally, those in the fourth group said that the description was "applicable to a high degree" to their work environment and were labeled Highly Supportive (n = 318).

All participants completed the questionnaire individually focusing their responses on their perception of their immediate working environment. The SOQ was distributed through the various organizations mail systems along with a memorandum describing the purpose of the measure. The participants from educational and organizational research studies were given the questionnaire by the senior author in classroom settings and were collected immediately upon completion. Completed instruments were then returned to CPSB for scoring and analysis. Steps were taken to ensure voluntary participation and confidentiality.

Results and discussion. The means and standard deviations of the four groups on each dimension, as presented in Table 153, indicate that the scores on all the SOQ dimensions increased as the individuals perceived their immediate work environment as more supportive to their personal creativity (except for the Conflict dimension, which decreased). To determine if differences were statistically significant between the four groups, a one-way multivariate analysis of variance (MANOVA) was conducted. This was followed by nine one-way analyses of variance (ANOVA's) for the nine dimensions to determine the strength and statistical significance of the differences among all four categories on each dimension. The MANOVA results were statistically significant [Wilks' Lambda = .46, $F(3,1826) = 53.54$, $p < .001$]. The subsequent one-way ANOVA's (See Table 193) showed that this effect was statistically significant for all dimensions. The F-value for each dimension was statistically significant at $p < .001$. The magnitude of the effect sizes as measured via R2, were all greater than .26 and may be considered large (Cohen, 1977).

The preceding results provide evidence that a statistically significant difference does exist between the respondents' reports of perceived support for creativity and the scores for the SOQ dimensions. The results show that individuals who perceive their immediate work environment as more supportive of their creativity report higher mean scores on those dimensions of the SOQ that are positively related to the creative climate. Lower mean scores were observed for the Conflict dimension for those who report more support for their personal creativity. This suggests that there is a meaningful relationship between the manner in which individuals perceive their work environment and how they view the environment's ability to support their personal creativity in the organizational settings included in this study.

Table 153
SOQ Means and Standard Deviations Sorted by Support of the Immediate Work Environment to Personal Creativity With Results of one-way ANOVA'S Between Groups*

Dimension	Not Supportive (n=201)		To Some Extent (n=609)		Fairly Supportive (n=702)		Highly Supportive (n=318)			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F**	R^2
Challenge/Involvement	149.2	68.5	187.3	56.4	224.3	50.0	257.7	45.8	221.33	.27
Freedom	135.9	51.6	168.8	47.4	204.6	42.8	237.7	45.4	275.14	.31
Trust/Openness	98.0	47.8	140.6	45.4	176.3	45.0	215.3	49.3	334.94	.36
Idea-Time	77.7	55.8	115.1	50.0	150.6	51.9	193.5	57.6	256.62	.30
Playfulness/Humor	103.1	54.8	143.9	50.9	179.9	50.0	216.3	55.5	252.52	.29
Conflict	178.3	63.7	136.2	58.8	108.2	53.6	77.4	53.4	158.53	.21
Idea-Support	109.8	57.0	167.8	50.2	213.0	49.5	251.0	49.9	406.10	.40
Debate	127.7	61.2	167.2	54.1	201.1	49.1	233.1	48.0	216.80	.26
Risk-Taking	112.0	48.2	139.8	40.4	166.8	35.9	194.2	44.2	223.68	.27

*df = 3, 1826 ** all p values < .001

There are, however, several limitations to this study. First, only a single item was used to categorize the subject groups. Additional omnibus items may be added to obtain an improved sense of how the respondents perceive the overall creative climate in their immediate work environment.

It may also be useful to examine further how the SOQ dimensions relate to other measures such as job satisfaction and other measures of organizational climate, creative climate, and culture. For example, Turnipseed (1994) found that several job satisfaction factors and social environmental variables are related to the SOQ dimensions.

The coefficient alpha of two dimensions is below .70, which is commonly used as an acceptable baseline for a research instrument (Freedom, .69, and Risk-Taking, .52). The SOQ version used in this study was the third revision. Subsequent revisions of the questionnaire have addressed this issue and improvements have been reported in the literature (Isaksen, et al., 1999). Future research will continue exploring means to improve the questionnaire's reliability.

Another limitation to this study is that the ratings of the overall environmental support for creativity were measured by self-reports. Additional research using outside observers and a variety of alternative measures are needed to validate further the dimensions of creative climate assessed by the SOQ. Further utility can be realized from a study of this nature if a large random sample were acquired and analyzed, since the findings and insights could be transferred to other organizational settings with higher levels of confidence. Finally, since climate is conceived as an attribute of the organization, future validation studies should also focus on organizational performance measures.

An additional limitation is that both the criterion measure (omnibus question) and the SOQ were combined and completed by respondents at the same time. Shared method variance may result and this may be an issue in a study of this nature. Further research should take this into account.

Despite these limitations, this study has many merits. The large sample size and the wide variety of organizations it contains provide a base for other studies on the topic to build upon, and upon which to make comparisons. The sample size also allows further studies to be conducted that may address how perceived level of support for creativity relates to the type of industry, the intensity of the technology used, and the rate of change of technology in that industry. These and other questions may also be studied in relation to the departments within an organization or the functions individuals perform in the organization.

Discriminating climates for creative teamwork

The need for organizational change stems from two basic sources. Numerous external and internal forces drive the changes that organizations have to anticipate and manage as a means to ensure their survival and success. Changes in government policies and regulations, actions taken by competitors, and changing needs and desires of customers are a few examples of external drivers of change coming from the marketplace. A survey of 506 CEO's from around the world

conducted in 2000 and published in 2001 by The Conference Board and Accenture shows what some of the major market challenges are today (see Table 154).

Table 154
Ten Leading Marketplace Challenges

Challenge	Percent identifying as a challenge
Changes in type/level of competition	40.7%
Impact of the Internet	38.3%
Industry consolidation	37.4%
Downward pressure on prices	33.4%
Shortages of key skills	31.6%
Changing technology	21.9%
Changes in supply/distribution systems	19.2%
Access to/cost of capital	16.6%
Regulatory issues (labor, market access, etc.)	15.0%
Currency issues	7.7%

Source: The CEO Challenge: Top Marketplace and Management Issues 2001 by The Conference Board

All organizations must also face the demands of increased efficiency, flexibility and growth. These internal issues are core challenges for leaders and managers within organizations. Table 155 shows the results obtained on The Conference Board and Accenture survey when CEO's were asked to rate management issues.

The potential role of teams in handling both the marketplace and management challenges identified in this survey were apparent in a variety of ways. Beyond the formal organizational structure, often depicted in organizational charts, the way most leaders and managers deal with these challenges is through the use of teamwork. Experience has shown that:

- Senior management must work together as a team to build a shared vision and strategy for the organization

- Middle management must team cross-functionally to meet most of these challenges
- Supervision must demonstrate team competence in organizing to get people to accomplish tasks
- Projects and initiatives within all parts of the organization require teamwork to meet the novelty and complexity of obtaining the objectives on which they are focused

Table 155
Ten Leading Management Challenges

Challenge	Percent identifying as a challenge
Customer loyalty/retention	37.2%
Increasing flexibility and speed	33.6%
Competing for talent	29.2%
Reducing costs	28.9%
Managing mergers/acquisitions/alliances	23.9%
Increasing innovation	21.9%
Engaging employees in the company's vision/values	20.8%
Developing and retaining potential leaders	20.0%
Launching new technology initiatives	19.8%
Improving the stock price multiple	18.0%

Source: The CEO Challenge: Top Marketplace and Management Issues 2001 by The Conference Board

The Conference Board and Accenture survey went on to examine what drivers of change are being focused upon by CEO's today. These interviews revealed that CEO's felt the key drivers for the challenges of Increased Flexibility and Speed, and Competing for Talent include:

- Keeping pace with new technology and product innovations
- Creating Organizational structures that promote flexibility and speed
- Making faster decisions enabled by increasingly rapid information flow

- Obtaining the right kind of people for the new market conditions
- Creating a higher purpose that instills a passion that people now want from work
- Overcoming the lack of younger workers to replace retiring baby boomers (which consists of individuals born between the years 1946-1962. This accounts for 81 million people in the USA).

Conceptual Frame. In our practice over the years we have worked with a number of organizations in a number of situations and at a variety of levels. Part of that work often focused on team building and team development as a means to promote creativity and increase problem-solving skills in organizational settings. It became apparent to us that the work we were doing with team creativity had a direct impact on all the drivers mentioned by CEO's in the Conference Board and Accenture survey. We felt that an empirical study of team creative climate might be able to shed some light on the nature and nurture of teams as a means to improve organizational climate, flexibility, productivity and profitability. We explored the questions of what type of climate facilitates team creativity and inversely, what type of climate hinders team creativity. The literature has been summarized regarding the characteristics that promote teamwork and the dimensions of the creative climate. An exploratory investigation, from the world of professional services, provided initial evidence that the climate for most and least creative teams is clearly distinguishable. Thus, since the climate for successful team creativity and performance is identifiable, it is measurable and more importantly it is manageable. We will explore these manageable aspects found in this study and suggest further avenues of research for this topic.

Teams are one of the basic building blocks of every organization. After individuals, they may be considered the most important resource in any organization.

That so much real day-to-day work within organizations is conducted more and more by teams explains the interest in high-performance work systems, electronic groupware, small-group facilitation skills, and a host of other strategies for improving the way groups work. However, before we continue we think it would be helpful to explore what we mean by a team. According to the Merriam-Webster dictionary the

word “team” is derived from the Middle English teme, from the Old English team that was used to describe a group of draft animals. Merriam-Webster defines the current use of the word to mean ‘a number of persons associated together in work or activity as:

- a group on one side (as in football or a debate)
- a crew, gang

For us a team means a combination of individuals who come together or who have been brought together for a common purpose or goal in their organization. Since teamwork is so important for organizational effectiveness, and climate is emerging as a construct to be assessed, understood and improved, the purpose of this study was to explore the climate for creativity within teams.

Characteristics that Promote Teamwork. Authors, researchers and practitioners have offered many suggestions for productive teamwork. Given how important it is to be able to contribute productively as a member of a working group, it is interesting to note the increased interest in developing teamwork skills (Belbin, 1981 a & b; Carnevale, Gainer & Meltzer, 1990; Guzzo & Salas, 1995; Katzenbach & Smith, 1993; Katzenbach, 1998). This section of the study will provide some general characteristics that promote teamwork and some tripwires to watch out for when working with groups.

There are a variety of ways to differentiate working groups from teams. One senior executive with whom we have worked described groups as individuals with nothing in common except a zip/postal code. Teams, however, were characterized by a common vision. Smith (1996) described a team as “…a small number of people with complementary skills who are mutually committed to a common purpose, a common set of performance goals, and a commonly agreed upon working approach.” The following dozen characteristics of productive teams have been formulated from reviewing the work of McGregor (1967), Bales (1988) and Larson & LaFasto (1989).

Having a clear and elevating goal means having understanding, mutual agreement and identification with respect to the primary task a group faces. For instance, one of

our client's R&D teams had the task of revamping how the department developed their products. This team concluded that their current practices did not take into account any customer input and it became their goal to introduce consumer input into the process. Active teamwork toward common goals happens when members of a group share a common vision of the desired future state.

Individuals within groups feel productive when their efforts take place with a minimum of grief. Open communication, clear coordination of tasks, clear roles and accountabilities, monitoring performance, providing feedback, fact-based judgment, efficiency, and strong impartial management combine to create a results-driven structure.

Competent teams are comprised of capable and conscientious members. Members must possess essential skills and abilities, a strong desire to contribute, be capable of collaborating effectively, and have a sense of responsible idealism. They must have knowledge in the domain surrounding the task (or some other domain which may be relevant) as well as with the process of working together.

Having a shared commitment relates to the way the individual members of the group respond. Effective teams have an organizational unity; members display mutual support, dedication and faithfulness to the shared purpose and vision, and a productive degree of self-sacrifice to reach organizational goals.

Productive teamwork does not just happen. It requires a climate that supports co-operation and collaboration. This kind of situation is characterized by mutual trust...trust in the goodness of others. Organizations desiring to promote teamwork must provide a climate within the larger context that supports co-operation.

Effective teams establish clear standards of excellence. They embrace individual commitment, motivation, self-esteem, individual performance, and constant improvement. Members of teams develop a clear and explicit understanding of the norms upon which they will rely.

Team members need resources, rewards, recognition, popularity and social success. Being liked and admired as individuals and respected for belonging and contributing to a team is often helpful in maintaining the high level of personal energy required

for sustained performance. With the increasing use of cross-functional and inter-departmental teams within larger complex organizations, teams must be able to obtain approval and encouragement.

Leadership is important for teamwork. Whether it is a formally appointed leader or leadership of the emergent kind, the people who exert influence and encourage the accomplishment of important things usually follow some basic principles. Principled leadership includes the management of human differences, protecting less able members, and providing a level playing field to encourage contributions from everyone. This is the kind of leadership that promotes legitimate compliance to competent authority.

Teamwork is encouraged when the tasks and situations really call for that kind of activity. Sometimes the team itself must set clear boundaries on when and why it should be deployed. One of the easiest ways to destroy a productive team is to overuse it or use it when it is not appropriate to do so.

One of the best ways to encourage teamwork is to engage the members of the team in the process of identifying the challenges and opportunities for improvement, generating ideas, and transforming ideas into action. Participation in the process of problem solving and decision-making actually builds teamwork and improves the likelihood of acceptance and implementation.

Effective teams know how to have a good time, release tension, and relax their need for control. The focus at times is on developing friendship, engaging in tasks for mutual pleasure and recreation. This internal team climate extends beyond the need for a collaborative climate.

Teams often face the challenges of organizing and defining tasks. In order for teams to remain productive, they must learn how to make necessary changes to procedures. When there is a fundamental change in how the team must operate, different values may need to be accommodated. Productive teams learn how to use the full spectrum of their members' creativity.

The following nine dimensions are the same as for the organizational application of the SOQ and have been modified to apply more to teams:

- **Challenge/Involvement** means the extent to which teams are given opportunities to get involved in the daily operations, long-term goals, and visions of the organization. When there is a high degree of Challenge and Involvement team members feel motivated, energized, and committed to making contributions. The climate is dynamic, electric, and inspiring. Team members find their work to be personally fulfilling and meaningful to their team and organization. In the opposite situation, team members are not engaged and feelings of alienation and apathy are present. The team lacks direction, members lack interest in their work and interpersonal interactions within and without the team are dull and listless.
- **Freedom** refers to the degree that teams can take initiative or are at liberty to act without constantly referring to higher authorities or 'rule books' for decisions. The team members exhibit independence in behavior and the team is given the autonomy and resources to define much of their work. Team members are provided the opportunities and take initiatives to acquire and share information about their work. In the opposite climate teams work within strict guidelines and are not allowed to take initiative. Team members carry out their work in prescribed ways with little room to redefine their tasks.
- **Trust/Openness** refers to the degree of emotional safety in relationships. When there is a high degree of trust, team members rely on one another and feel 'safe' enough to be open and honest with their colleagues, in the spirit of constructive relationships. Team members are genuinely open and frank with one another. They count on each other for professional and personal support. Team members have a sincere respect for one another and give credit where credit is due. Where Trust is missing, team members are suspicious of each other, and therefore, they closely guard themselves, their plans, and their ideas. In these situations team members find it extremely difficult to openly communicate with each other and function as a team.
- **Idea-Time** is the time the team takes off to generate new ideas or consider the merits of existing ideas and opportunities. In the high Idea-Time situation, possibilities exist to discuss and test suggestions not included in the task

- assignment. There also are opportunities to take the time to explore and develop new ideas. Flexible timelines permit team members to explore new avenues and alternatives. In the reverse case, every minute is booked and specified. The time pressure makes thinking outside the instructions and planned routines impossible.
- **Playfulness/Humor** refers to the amount of spontaneity and levity displayed within the team. A professional, yet relaxed atmosphere where good-natured jokes and laughter occur often is indicative of this dimension. Team members can be seen having fun within the team and at work. The climate is seen as easy-going and light-hearted. The opposite climate is characterized by gravity and seriousness within the team. The atmosphere is stiff, gloomy and cumbrous. Jokes and laughter are regarded as improper and intolerable.
- **Conflict** means the presence of personal and emotional tensions within the team and between team members. When the level of Conflict is high, team members dislike and may even hate each other. The climate can be characterized by "interpersonal warfare." Plots, traps, and power and territory struggles are usual elements of team functioning. Personal differences yield gossip and slander. In the opposite case, team members behave in a more mature manner; they have psychological insight and control of impulses. The team welcomes, accepts and deals effectively with diversity. Conflict is the only negative dimension, for which a lower score is generally better.
- **Idea-Support** refers to the ways new ideas are considered, taken up or advocated by the team. In the supportive climate, ideas and suggestions are received in an attentive and professional way by teammates. They listen to each other and encourage initiatives. Possibilities for trying out new ideas are created within the team. The team atmosphere is constructive and positive when considering new ideas. When Idea-Support is low, the automatic "no" is prevailing within the team. Fault-finding and obstacle-raising are the usual styles of responding to ideas.

- **Debate** is the occurrence of encounters and disagreements between viewpoints, ideas, and differing experiences and knowledge within the team. Conflict relates to personal tension while debate is related to idea-tension. In the Debating team all the voices of team members are heard and they are keen on putting forward their ideas for consideration, and their merits are openly debated and resolutions reached. Where Debate is missing, team members follow authoritarian patterns and procedures without questioning them or exploring alternatives.
- **Risk-Taking** refers to the degree to which the team can tolerate ambiguity and make decisions with some uncertainty. Team members are prepared to live with the potential negative consequences. In the high Risk-Taking case, teams take bold initiatives even when the outcomes are unknown. Teams and team members feel as though they can "take a gamble" on ideas. They will often "go out on a limb" to put an idea forward. In a risk-avoiding climate there is a cautious, hesitant mentality within the team. Team members will lack decisiveness, try to be on the "safe side" and often "sleep on the matter." They may set up committees, defer decisions to other teams, and cover themselves in many ways.

Previous research with the SOQ used the organization (Lauer & Isaksen, 2001) as the unit of analysis. All of our previous studies regarding these dimensions have been conducted with individual psychological climate as the unit of analysis (Isaksen & Kaufmann, 1990; Isaksen & Lauer, 1999; Isaksen, Lauer, Ekvall & Britz, 2001). This study represents an initial attempt to use teams as the unit for comparison (Isaksen & Lauer, 2002).

Method. The data were collected as a part of a distance learning workshop within a large global professional services firm that was led by the lead author from a site in Baltimore, Maryland USA. This sample was chosen because those providing a variety of professional consulting services to a diverse kind of organization would provide a broad lens for this initial study. The workshop was called “Teamwork for Innovation”

and was one of a series of workshops offered within the program. The participants in the study were all enrolled in this series of workshops as a part of their own interest in developing their leadership and management skills. The 170 participants were all managers in the firm. They had at least three to five years experience and all elected to participate in this module. They came from 23 locations in North America including Boston, New York, Miami, Toronto, Tampa, and Atlanta.

A set of nine questions was designed to summarize the key behaviors described in the dimensions above. Participants used the same set of nine questions for two different tasks. One asked them to recollect their most creative team experience, and the other asked them to recall their least creative team experience. A tenth open-ended item was included to ask what factor the respondent thought was most important or detrimental to the success of the team.

Before they were given a description of climate, or any of the dimensions outlined above, the participants were invited to respond nominally to the nine closed-ended questions after identifying the most creative team they have experienced. The definition provided to them regarding the most creative team was one that produced something that was: new, unique, or original; valuable, relevant and useful; and accepted, produced results, and made a positive impact. In addition, they were asked to write a narrative response to the question: What do you think was the most important factor accounting for the team's success? The distance learning technology allowed the presenter to know the number and percentage of respondents for every question.

After 90% of the participants completed their responses to the above questions, they were requested to respond nominally to nine additional closed-ended questions about their least creative team experience. The least creative team was described for them as one that produced something that was: well within previous practice or standard, where they "reinvented the wheel;" useless or valueless; and was rejected or produced very little or no impact. They were also asked to respond to an open-ended question that asked them to identify the most significant barrier hindering the team's success.

Participants could choose a number for each of the sets of nine questions that ranged from zero to three. Assigning the number zero meant that they did not observe the dimension at all. Giving a team the number one signified that they observed a dimension to some extent. Two meant that the dimension was fairly applicable. Three signified that they observed the dimension very often. Each participant was able to read each of the two sets of nine questions on their own personal monitor and select a number indicating their assessment of the frequency of the behavior described in the dimension. All quantitative responses were electronically conveyed to the distance learning provider and the results were aggregated and recorded. All narrative responses were also electronically communicated and summarized by the provider.

The comments were transcribed onto one master list and numbered for future reference. The first list included all the factors of success and the second, all the barriers identified by the participants. Each list was analyzed separately to identify key themes. The themes were identified on a separate list and all comments were placed into a theme. The work on creating themes from the responses continued until all comments were included.

Each list was then given to a second reviewer and was checked by having another reviewer independently place each comment into a theme. There was 97% agreement of fit and the few comments that did not agree provided additional clarity of definition for the theme.

Since there were no controls to ensure that all participants completed all questions before proceeding, a different number of responses were collected for each of the two sets of nine questions. As a result, averages were used for comparison purposes. In addition, some participants provided more than one response to the narrative questions, and others chose not to respond at all. All narrative responses were recorded separately as factors for success and barriers. These responses were then themed using content analysis and were validated by two independent raters with a 97% agreement with the themes.

Results. The quantitative comparisons between the most and least creative teams are presented in Table 156.

Table 156
Averages of the Most and Least Creative Team Responses
(n =154)

Dimension	Most Creative Team Experience	Least Creative Team Experience
Challenge/Involvement	260	100
Freedom	202	110
Trust/Openness	253	88
Idea-Time	227	65
Playfulness/Humor	235	77
Conflict	27	123
Idea-Support	218	70
Debate	231	83
Risk-Taking	210	65

Significant differences were observed on all nine mean scores (see Table 157). These results were consistent with results of the Isaksen, Lauer, Ekvall & Britz's (2001) SOQ study of individual perceptions of their best and worst-case experience in a job. They are also consistent with an SOQ study by Isaksen & Lauer (2001) that explored the individuals' perception of perceived support for creativity. These previous studies used the individual level of analysis as the unit for comparison, while this was the first study using teams.

Table 157
Tests of Significance on the Most and Least Creative Team Responses (n = 154)

Dimension	t Value	Statistical Significance
Challenge/Involvement	11.63	.01
Freedom	8.98	.05
Trust/Openness	30.06	.001
Idea-Time	15.39	.01
Playfulness/Humor	24.54	.01
Conflict	-31.73	.001
Idea-Support	12.82	.01
Debate	15.16	.01
Risk-Taking	10.19	.01

These quantitative results are consistent with the previous research with the SOQ using both an individual and organizational unit of analysis.

Qualitative Results. In addition to the quantitative questions included on the SOQ, there are three open-ended questions that allow the participants to identify what's working or helping their creativity, what's hindering their creativity, and what they would do to improve the climate. For the purposes of this study one open-ended item asked the participants to identify what factor was most important or detrimental to the success of the team. The main themes derived from a qualitative analysis of the 330 narrative comments received by the 160 subjects are summarized as:

- **Interpersonal Dynamics.** The more creative teams had the ability to work together without major conflicts in personalities. There was a high degree of respect for the contributions of others. Communication was characterized by "The willingness of team members to listen to one another and honor the opinions of all team members." Members of these teams reported that they knew their roles and responsibilities and that this provided freedom to develop new ideas. In the least creative teams there was an "unwillingness to communicate with one another because people did not make the effort to understand each other." There were instances of animosity, jealousy, and political posturing.
- **Energy and Motivation.** The more creative teams "played hard and worked even harder." Team members enjoyed contributing and celebrated their accomplishments. "All team members were motivated to do the best job possible in reaching the end goal, so everyone was willing to pitch in to get the job done." There was a high degree of enthusiasm and commitment to get the job done. On the least creative teams there was a lack of motivation. There was a lack of initiative, ideas, and follow through on suggestions. The least creative teams had a "lack of motivation and the inability to recognize the value provided by the end result."
- **Openness.** The most creative teams had an environment that encouraged new ideas and allowed the development of new ways of working. "No matter what the disagreements, we all knew that we had to bring our ideas together to get the job done." Everyone felt comfortable discussing ideas, offering suggestions because "…ideas were received in a professional and attentive manner…people felt free to brainstorm to improve others' ideas without the authors' feelings getting hurt. In the least creative teams new ideas were not attended to or encouraged because "…individuals placed their own priorities before the teams'." They were characterized as not being able to discuss multiple solutions to a problem because team members couldn't listen to any opinion other than their own. In these teams, members were "…expected to follow what had always been done and finish as quickly as possible."

- **Leadership.** In the most creative teams the "… leader led by example, encouraging new ideas and sharing best practices." Leaders provided clear guidance, support and encouragement, and kept everyone working together and moving forward. Leaders also worked to obtain support and resources from within and outside the group. In the least creative teams, the leader "…created a situation where everyone was confused and afraid to ask questions." Leaders "tore down people's ideas," "set a tone of distrust," and "stifled others who had ideas and energy to succeed." They "…kept all control, but took no action."
- **Focus, Direction, and Goals.** The most creative teams had clear and common goals. "The most important factor accounting for my team's creative success was, undoubtedly, each member's drive to attain the end goal, knowing the benefits that would be derived from the results." The goals were clear and compelling, but also open and challenging. The least creative teams had conflicting agendas, different missions, and no agreement on the end result. "Everyone did their own thing without keeping in mind the overall objective that the group was charged to achieve." The tasks for the least creative teams were tightly constrained, considered routine, and were overly structured.
- **Trust.** The most creative team members trusted each other, promoted open and honest communication and supported each other's views. "The most important factor for the success of the team was the overwhelming trust we had for each other, both personal and work-related." In the least creative teams there was "…Absolutely no trust among team members. Everyone was suspect of someone's underlying motives."
- **Diversity of skills and experience.** The most creative teams recognized the diverse strengths and talents and used them accordingly. "Each individual brought a cornucopia of experience and insight. All of this, together with the desire to meet the end goal was the key to success." The least creative teams had inadequate skill sets and were unable to effectively utilize their diversity.

The themes derived through qualitative analysis are consistent with much of the literature regarding effective teamwork and contain characteristics that respond to tripwires and goal structures.

The significant results reported on the basis of well over one hundred different team experiences indicate that there are clear and meaningfully distinct climates for creative team performance. The results of this study were also consistent with previous research on creative climate and the literature on small group effectiveness.

There are many implications for those who lead and manage organizations. One of the most important is that teams requiring creativity in order to pursue their tasks need to attend to the dimensions of the creative climate, as well as the factors derived from the narrative comments. Attending to these ingredients of creative team climate is a function well suited for the leader or facilitator of the group. This facilitation and leadership must be done in such a way that it establishes, nourishes, and maintains a climate that is appropriate for the team to succeed. There is more than sufficient literature to support this facilitative kind of leadership within teams (Isaksen, 2000).

The study does have some limitations that need to also be identified. The first is that the results are based on the internal self-perceptions of the respondent and these were not observed or validated by an outside source as being either a creative or non-creative team. The use of a virtual platform for the collection of the responses to the questions is also a concern because there were time limits for the completion of the questions and not every participant completed the questionnaire.

Our observations from completing this study suggest many productive areas of further inquiry in this area. First we suggest that future researchers utilize the entire SOQ to ensure that the questionnaire used is reliable and has support for its validity. We would also recommend that intact work teams be used and that external measures of creative productivity be used.

A final recommendation focuses on the facilitation and leadership abilities of individuals in the team. Our observations from the field have been that teams containing individuals who have facilitation and leadership skills are more efficient, effective and creative than teams that are lacking these skills (Bradford, 1976; Isaksen, 1986). A study of teams that controls for these variables could lead to some empirical support of our general observations.

SOQ Team Version

Since the investigation of teamwork provided a clear indication that the SOQ was able to discriminate between most and least creative teams, some clients have requested the application of the SOQ using teams as the unit of analysis. A new version of the SOQ was created by rewording the 53 items to fit the context of teams, rather than focusing on the workplace climate. An initial opportunity was provided by Destination Imagination to allow for some data collection using this new version of SOQ Team.

Destination Imagination (DI) is a unique educational program in which students from a variety of grade levels are able to solve challenges through creative problem solving and teamwork. Each team is lead by a Team Manager. These teams are usually not part of the regular school program and are "elective" in nature. In short, we expected that the data we would collect on DI would indicate results closer to the more creative teams from the previous study.

Table 158
SOQ-Team Results from Destination Imagination Secondary Teams

Dimensions	Most Creative team	DI Teams	Least Creative Teams
Challenge/Involvement	260	235	100
Freedom	202	207	110
Trust/Openness	253	207	88
Idea-Time	227	199	65
Playfulness/Humor	235	260	77
Conflict	27	83	123
Idea-Support	218	233	70
Debate	231	226	83
Risk-Taking	210	229	65
N	**154**	**30**	**154**

For the purposes of this study, we asked only those team members who were in secondary school grades (grades 9-12) to participate. A separate version of the SOQ was prepared with input from the DI administration and Dr. Treffinger of the Center for Creative Learning. We focused on keeping the items worded so that they would be framed the same way and measure the same dimension as those on the original SOQ. The results from eight DI teams are presented in Table 158.

The averages from the eight DI teams do, in fact, approximate the most creative team results for nearly all nine of the dimensions. Further research and development is needed on this version, but the initial results are promising.

As stated earlier, a measure's validity is established over time through a series of studies. The studies cited in this chapter begin to provide support for the validity of the SOQ. These studies have shown good support for the content measured by the SOQ and their relationship to organizational variables (e.g., stress, performance, etc.). Further, differences among people, such as personalities, appear not to influence their perceptions of climate. Taken together these investigations provide mounting support for the validity of the SOQ.

REFERENCES

Amabile, T. M. & Gryskiewicz, S. S. (1988). Creative human resources in the R & D laboratory: How environment and personality affect innovation. In R. L. Kuhn (Ed.), *Handbook for creative and innovative managers* (pp. 501-524). New York: McGraw-Hill.

Amabile, T. M., Conti, R., Coon, H., Lazenby, J., Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal, 39* (5), 1154-1184.

Bales, R. F. (1988). Overview of the SYMLOG system: Measuring and changing behavior in groups. San Diego, CA: SYMLOG Consulting Group.

Belbin, M. (1981a). *Management teams: Why they succeed or fail*. San Diego, CA: Pfieffer & Co.

Belbin, M. (1981b). *Team roles at work*. San Diego, CA: Pfieffer & Co.

Besemer, S. P. (1998). Creative Product Analysis Matrix: Testing the model structure and a comparison among three products. *Creativity Research Journal, 11*, 333-346.

Besemer, S. P. & O'Quin, K. (1987). Creative product analysis: Testing a model by developing a judging instrument. In S. G. Isaksen (Ed.), *Frontiers of creativity research: Beyond the basics* (pp. 341-357). Buffalo, NY: Bearly Limited.

Besemer, S. P., & O'Quin, K. (1999). Confirming the three-factor Creative Product Analysis Matrix in an American sample. *Creativity Research Journal, 12*, 287-296.

Besemer, S. P., & Treffinger, D. J. (1981). Analysis of creative products: Review and synthesis. *Journal of Creative Behavior, 15*, 158-178.

Bradford, L. P. (1976). *Making meetings work: A guide for leaders and group members*. San Diego, CA: University Associates.

Brewer, J. & Hunter, A. (1989). *Multimethod research: A synthesis of styles*. Newbury Park: Sage.

Britz, A. (1995). *The assessment of climate for innovation in organizations*. Unpublished master's thesis, Technische Hochshule Darmstadt.

Cabra, J. F. (1996). *Examining the reliability and factor structure of the Climate for Innovation Questionnaire*. Unpublished master's thesis, State University College at Buffalo, New York.

Carnevale, A. P., Gainer, L. J., & Meltzer, A. S. (1990). *Workplace basics: The essential skills employers want*. San Francisco: Jossey-Bass.

Clapp, R. G., (1991). *The fate of ideas that aim to stimulate change in a large organisation*. Unpublished doctoral dissertation. Hertsfordshire. UK: Hatfield Polytechnic/Council for National Academic Awards.

Clapp, R. G. & deCiantis, S. M. (1987). *The influence of organizational climate on the relationship between cognitive style and observed behaviour*. Working paper, Occupational Research Centre, Hatfield Polytechnic, UK.

Clapp, R. G. & Kirton, M. J., (1994). The relationship between cognitive style and psychological climate: Some comments on the article by Isaksen & Kaufmann. *Studia Psychologica, 36*, 129-134.

Cohen, J. (1977). Statistical power analysis for the behavioral sciences. San Diego, CA: Academic Press.

Cooper, C. L., Sloan, S. J., & Williams, S. (1988). *Occupational Stress Indicator: Technical guide*. Windsor, UK: NFER-Nelson.

Costello, A. B. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research and Evaluation, 10*, 1-9.

Denzin, N. K. (1978). The research act: *A theoretical introduction to sociological methods* (2nd ed.). Chicago: Aldine.

Denzin, N. K. & Lincoln, Y. S. (1994). (Eds.). *Handbook of qualitative research*. Thousand Oaks, CA: Sage.

Denzin, N. K., & Lincoln, Y. S. (2005). *The SAGE handbook of qualitative research*. Thousand Oaks, CA: Sage.

Dutcher, A. (1997). *Understanding the relationship between creative climate and leadership practices*. Unpublished Master's project, The Center for Studies in Creativity, Buffalo State College, Buffalo, NY.

Edwards, J. R., Cable, D. M., Williamson, I. O., Lambert, L. S., & Shipp, A. J. (2006). The phenomenology of fit: Linking the person and environment to the subjective experience of person-environment fit. *Journal of Applied Psychology, 91,* 802-827.

Ekvall, G. (1987). The climate metaphor in organization theory. In B. Bass & P. Drenth (Eds.), *Advances in organizational psychology* (pp. 177 - 190). Beverly Hills, CA: Sage.

Ekvall, G. (1991). The organizational culture of idea-management: A creative climate for the management of ideas. In J. Henry and D. Walker (Eds.), *Managing innovation* (pp. 73-79). London: SAGE Publications Ltd.

Ekvall, G. (1996). The organizational climate for creativity and innovation. *European Journal of Work and Organizational Psychology, 5*, 105-123.

Ekvall, G. & Ryhammer, L. (1998). Leadership style, social climate and organizational outcomes: A study of a Swedish university college. Creativity and Innovation Management, 7 (3), 126-130.

Ekvall, G., Arvonen, J., & Waldenström-Lindblad, I. (1983). *Creative Organizational Climate: Construction and validation of a measuring instrument*. Stockholm, Sweden: The Swedish Council for Management and Organizational Behaviour (Report No. 2).

Ferrando, P. J., & Lorenzo-Seva, U. (2000). Unrestricted versus restricted factor analysis of multidimensional test items: Some aspects of the problem and some suggestions. *Psicológica, 21*, 301-323.

Gage, N. L. (1989). The paradigm wars and their aftermath: A "historical" sketch of research on teaching since 1989. *Educational Researcher, 18*, 4-10.

Geurts, M. (2009). *An examination of the model for organizational change, innovation and creativity*. Unpublished Masters Thesis. Hogeschool-Universiteit Brussel. Brussels, Belgium.

Glaser, B. G. & Strauss, A. L. (1967). The discovery of grounded theory: Strategies for qualitative research. New York: Aldine.

Goetz, J. P. & LeCompte, M. D. (1984). Characteristics and origins of educational ethnography. In J. P. Goetz, & M. D. LeCompte (Eds.) *Ethnography and qualitative design in educational research* (pp. 1-32). New York: Academic Press.

Grivas, C. C. (1996). *An exploratory investigation of the relationship of cognitive style with perceptions of creative climate*. Unpublished masters thesis. Center for Studies in Creativity, State University College at Buffalo.

Guzzo, R. A., & Salas, E. (1995). (Eds.). *Team effectiveness and decision making in organizations*. San Francisco: Jossey-Bass.

Hair, J. R. Jr., Anderson, R.E., Tatham, R. L., & Black, W. C. (1992). *Multivariate data analysis with readings* (3rd ed.). New York: Macmillan Publishing Co.

Hair, J.F., Jr., Anderson, R.E., & Tatham, R.L. 1987. *Multivariate Data Analysis with readings*. New York: Macmillan Publishing Company.

Harman, H. H. (1967). *Modern factor analysis* (2nd ed.). Chicago, IL: University of Chicago Press.

Hammerschmidt, P. K. (1996). The Kirton Adaption-Innovation Inventory and group problem-solving success rates. *Journal of Creative Behavior, 30*, 61-73.

Huberman, M., & Miles, M. B. (2002). (Eds.), *The qualitative researcher's companion*. Thousand Oaks, CA: Sage.

Hult, C. (2005). Organizational commitment and person-environment fit in six Western countries. *Organization Studies, 26,* 249-270.

Hurley, C., (1993). *The relationship between the Kirton Adaption-Innovation style and the use of creative problem solving*. Unpublished master's thesis. Center for Studies in Creativity, State University College at Buffalo.

Isaksen, S. G. (2004). The progress and potential of the creativity level - style distinction: Implications for research and practice. W. Haukedal, B. Kuvas (Eds.). *Creativity and problem solving in the context of business management* (pp. 40–71). Bergen, Norway: Fagbokforlaget.

Isaksen, S. G. (1986). Facilitating small group creativity. In S. S. Gryskiewicz & R. M. Burnside (Eds.), *Creativity Week VIII Proceedings* (pp. 71-84). Greensboro, NC: Center for Creative Leadership.

Isaksen, S. G., (1995). *The progress and potential of the creativity level-style distinction: Implications for research and practice*. A paper presented at the British Psychological Society's Occupational Psychology Conference. UK: University of Warwick.

Isaksen, S. G. (2000). Facilitative leadership: Making a difference with creative problem solving. Dubuque, IA: Kendall/Hunt.

Isaksen, S. G. (2009). Exploring the relationships between problem-solving style and creative psychological climate. In P. Meusburger, J. Finke, & E. Wunder (Eds.), *Milieus of creativity: An interdisciplinary approach to spatiality of creativity* (pp. 169-188). Heidelberg, Germany: Springer Science.

Isaksen, S. G. (2013). Managing for innovation: Examination of a climate-centric model for organizational creativity. *Kindai Management Review, 1*, 41-58.

Isaksen, S. G., & Aerts, W. S. (2011). Linking problem solving style and creative organizational climate: An exploratory interactionist study. *The International Journal of Creativity and Problem Solving, 21*, 7-38.

Isaksen, S. G. & Kaufmann, G. (1990). Adaptors and innovators: A discriminant analysis of the perceptions of the psychological climate for creativity. *Studia Psychologica: The Journal for Basic Research in Psychological Sciences, 32*, 129-141.

Isaksen, S. G. & Kaufmann, G. (1991). Adaptors and innovators: Different perceptions of the psychological climate for creativity. In T. Rickards, P. Colemont, P. Grøholt, M. Parker, and H. Smeekes, (Eds.), *Creativity and innovation: Learning from practice* (pp. 47-54). Delft, The Netherlands: Innovation Consulting Group TNO.

Isaksen, S. G., & Lauer, K. J. (1999). Relationship between cognitive style and individual psychological climate: Reflections on a previous study. *Studia Psychologica, 41*, 177-191.

Isaksen, S. G., & Lauer, K. J. (2001). Convergent validity of the Situational Outlook Questionnaire®: Discriminating levels of perceived support for creativity. *North American Journal of Psychology, 3*, 31-40.

Isaksen, S. G., & Lauer, K. J. (2002). The climate for creativity and change in teams. Creativity and Innovation Management, 11, 74-86.

Isaksen, S. G., Lauer, K. J., & Ekvall, G. (1999). Situational Outlook Questionnaire®: A measure of the climate for creativity and change. *Psychological Reports, 85,* 665-674.

Isaksen, S. G., Dorval, K. B., (1993). Toward an improved understanding of creativity within people: The level-style distinction. In S. G. Isaksen, M. C. Murdock, R. L. Firestien, D. J. Treffinger (eds.), *Understanding and recognizing creativity: The emergence of a discipline* (pp. 299-330). Norwood, NJ: Ablex.

Isaksen, S. G., Dorval, K. B., & Treffinger, D. J. (1994). *Creative approaches to problem solving.* Dubuque, IA: Kendall Hunt.

Isaksen, S. G., Dorval, K. B., & Treffinger, D. J. (2000). *Creative approaches to problem solving: A framework for change* (2nd ed.). DuBuque, IA: Kendall/Hunt.

Isaksen, S. G., Dorval, K. B., & Treffinger, D. J. (2011). *Creative approaches to problem solving: A framework for innovation and change* (3rd ed.). Thousand Oaks, CA: Sage Publishing.

Isaksen, S. G., Lauer, K. J., & Ekvall, G. (1999). Situational Outlook Questionnaire®: A measure of the climate for creativity and change. *Psychological Reports, 85*, 665-674.

Isaksen, S. G., Lauer, K. J., Ekvall, G., & Britz, A. (2001). Perceptions of the best and worst climates for creativity: Preliminary validation evidence for the Situational Outlook Questionnaire®. *Creativity Research Journal, 13*(2), 171-184.

Isaksen, S. G., Lauer, K. J., Murdock, M. C., Dorval, K. B., & Puccio, G. J. (1995). Situational Outlook Questionnaire®: U*nderstanding the climate for creativity and change (SOQ) - A technical manual*. Buffalo, NY: Creative Problem Solving Group - Buffalo.

Jaeger, R.M. (1990). *Statistics: A spectator sport* (2nd ed.). London: Sage.

James, L. R., (1982). Aggregation bias in estimates of perceptual agreement. Journal of Applied Psychology, 67, 219-229.

James, L. R., James, L. A., & Ashe, D. K. (1990). The meaning of organizations: The role of cognition and values. In B. Schneider (Ed.), *Organizational Climate and Culture* (pp. 40-84). San Francisco, CA: Jossey-Bass Publishers.

Kaiser, H. F. (1958). The varimax criterion for analytic rotation in factor analysis. *Psychometrika, 23*, 187-200.

Katzenbach, J. R. (1998). Teams at the top: Unleashing the potential of both teams and individual leaders. Cambridge, MA: Harvard Business School Press.

Katzenbach, J. R., & Smith, D. K. (1993). *The wisdom of teams: Creating the high-performance organization*. Cambridge, MA: Harvard Business School Press.

Kirton, M. J. (1976). Adaptors and innovators: A description and measure. *Journal of Applied Psychology, 61*, 622-629.

Kirton, M. J. (1994). Adaptors and innovators: Styles of creativity and problem solving (rev. ed.). London: Routledge.

Kirton, M. J. (1999). *Kirton Adaption-Innovation Inventory (KAI) – Manual*(3rd ed.). Occupational Research Centre: Hatfield, U.K.

Kirton, M. J., & deCiantis, S. M., (1994). Cognitive style in organizational climate. In M. J. Kirton (Ed.), *Adaptors and innovators: Styles of creativity and problem-solving* (pp. 72-90). London, UK: Routledge.

Kirton, M. J., & McCarthy, R. M., (1988). Cognitive climate and organizations. *Journal of Occupational Psychology, 61*, 175-184.

Kouzes, J. M. & Posner, B. Z. (1987). The leadership challenge: How to get extraordinary things done in organizations. San Francisco: Jossey-Bass.

Koys, D. J., & DeCotiis, T. A. (1991). Inductive measures of psychological climate. Human Relations, 44, (3), 265-285.

Kuzel, A. J. (1992). Sampling in qualitative inquiry. In B. F. Crabtree & W. L Miller (Eds.), *Doing qualitative research* (pp.31-44) (Research Methods for Primary Care Series.) Newbury Park, CA: Sage.

Larson, C. E., & LaFasto, F. M. J. (1989). *Teamwork: What must go right - what can go wrong*. Newbury Park, CA: SAGE Publications.

Lauer, K. J. (1994). *The assessment of creative climate: An investigation of Ekvall's Creative Climate Questionnaire*. Unpublished master's thesis. State University College at Buffalo, New York.

Lauer, K. J., & Isaksen, S. G. (2001). Managing the organizational climate for creativity and change: What you should be considering. In L. van Geoffen, H. van der Meer, and T. Rickards (Eds.) *Fit for the future: Proceedings of the sixth European conference on creativity and innovation* (pp. 132-141). Enschede, Netherlands: Twente University Press.

LeCompte, M. D., & Preissle, J. (1993). *Ethnography and qualitative design in educational research* (2nd ed.). San Diego, CA: Academic Press.

Lewin, K. (1951). Field theory in social science: Selected theoretical papers. New York: Harper & Brothers.

Lichtman, C. M., & Hunt, R. G. (1971). Personality and organization theory: A review of some conceptual literature. *Psychological Bulletin, 76*, 271-294.

Lincoln, Y. S. & Guba, E.G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.

Litwin, G. H., & Stringer, R. A. Jr. (1968). *Motivation and organizational climate*. Boston, MA: Harvard University.

McGregor, D. (1967). *The professional manager*. New York: McGraw-Hill.

Miles, M. B. & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.) Beverly Hills, CA: Sage.

Moos, R. (1986). *Work Environment Scale: Manual*. Palo Alto, CA: Consulting Psychologists Press.

Mudd, S. A. (1986). Analytic review of research on the Kirton Adaption-Innovation Inventory. *Social and Behavioral Sciences Documents, 16*, 2 (Ms No. 2775).

Murdock, M. C. (1994). *Designing and conducting qualitative research with creative analysis*. Paper presented at the Eastern Education Research Association's Annual Conference, Sarasota, FL.

Myers, I. B., & McCaulley, M. H. (1985). *A guide to the development and use of the Myers-Briggs Type Indicator*. Palo Alto, CA: Consulting Psychological Press.

Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Newbury Park, CA: Sage Publications, Inc.

Pershyn, G. S., (1992). *An investigation into the graphic depictions of natural creative problem solving processes*. Unpublished master's project. Buffalo, NY, Center for Studies in Creativity.

Puccio, G. J. (1990). Person-environment fit: Using Kirton's Adaptor-Innovator theory to determine the effect of stylistic fit upon stress, job satisfaction, and creative performance. Unpublished doctoral dissertation. University of Manchester Institute of Science and Technology, Manchester, England.

Puccio, G. J., Joniak, A. J., & Talbot, R. J., (1995). Person-environment fit: Examining the use of commensurate scales. *Psychological Reports, 76*, 931-938.

Puccio, G. J., Treffinger, D. J., & Talbot, R. J. (1995). Exploratory examination of relationships between creativity styles and creative products. *Creativity Research Journal, 8*, 157-172.

Reichers, A. E., & Schneider, B. (1990). Climate and culture: An evolution of constructs. In B. Schneider (Ed.), *Organizational climate and culture* (pp. 5-39). San Francisco: Jossey-Bass.

Russell, D. W. (2002). In search of underlying dimensions: The use (and abuse) of factor analysis. *Personality and Social Psychology Bulletin, 28,* 1629-1646.

Sackett, P. R., & Larson, J. R. Jr. (1990). Research strategies and tactics in industrial and organizational psychology. In M. D. Dunnette, & L. M. Hough E. F. (Eds.), *Handbook of industrial & organizational psychology* (pp. 419-489). Palo Alto, CA: Consulting Psychologists Press, Inc.

Schmied J. (1993). Qualitative and quantitative research approaches to English relative constructions. In Souter C. & Atwell E. (Eds.), *Corpus-based computational linguistics* (pp. 85-96). Amsterdam: Rodopi.

Schneider, B., (1987b). The people make the place. *Personnel Psychology, 36*, 573-611.

Schneider, B., & Reichers, A. E., (1983). On the etiology of climates. *Personnel Psychology, 36*, 19-39.

Schoonover, P. F. (1996). *The preference for and use of creative problem-solving tools among adaptors and innovators*. Unpublished doctoral dissertation. Walden University, Minneapolis, Minnesota.

Selby, E. C., Treffinger, D. J., & Isaksen, S. G. (2007). *VIEW: An assessment of problem solving style – Technical manual* (2nd ed.). Sarasota, FL: The Center for Creative Learning.

Selby, E. C., Treffinger, D. J., Isaksen, S. G., & Lauer, K. J. (2004). Defining and assessing problem-solving style: Design and development of new tool. *The Journal of Creative Behavior, 38*, 221-243.

Smith, D. K. (1996). Taking charge of change: 10 principles for managing people and performance. Reading, MA: Addison-Wesley.

Snow, R. E., (1992). Aptitude theory: Yesterday, today and tomorrow. *Educational Psychologist, 27*, 5-32.

Sobieck, M. A. (1996). *Examination of cross-site narrative responses on the CIQ and SOQ*. Unpublished masters thesis. Center for Studies in Creativity, State University College at Buffalo.

Sprinthall, R. C. (1982). *Basic statistical analysis*. Reading, MA: Addison-Wesley Publishing Co.

Strauss, A. L. (1987). *Qualitative Analysis for social scientists.* Cambridge, MA: Cambridge University Press.

Strauss, A. L. & Corbin, J. (1990). Basics of qualitative research: Grounded theory procedures and techniques. Newbury Park, CA: Sage.

Strauss, A. L. & Corbin, J. (1994). Grounded theory methodology: An overview. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 273-285). Thousand Oaks, CA: Sage.

Talbot, R. J., Cooper, C. L., & Barrow, S. (1992). Creativity and stress. *Creativity and Innovation Management, 1*, 183-193.

Taylor, S., & Gryskiewicz, N. (1993). A test of the validity of the Work Environment Inventory. *Educational and Psychological Measurement, 53*, 557-563.

Turnipseed, D. (1994). The relationship between the social environment of organizations and the climate for innovation and creativity. *Creativity and Innovation Management, 3*, 184-195.

Vogt, W. P. (1993). Dictionary of statistics and methodology: A non-technical guide for the social sciences. Newbury Park, CA: SAGE Publications.

Wheeler, J. W., (1995). *An exploratory study of preferences associated with creative problem solving*. Unpublished master's thesis. Center for Studies in Creativity, State University College at Buffalo.