



# DISC Technical Supplement



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# INTRODUCTION

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*Man's main task in life is to give birth to himself, to become what he potentially is. The most important product of his effort is his own personality.*

(FROMM, 1947)

The *DISC Personality System* published by the Institute of Motivational Living (IML) aims to help individuals identify their personal strengths and capitalise on their talents to make them more effective individuals. In identifying one's own and others' innate abilities, attributes, weaknesses and fears, the DISC helps people communicate better and work together more effectively. The concept of the DISC is based on William Marston's theories, which postulate that people basically possess one or more of four different personality styles:

- Dominance – this describes someone who is direct, decisive, a problem-solver, a risk taker and a self-starter
- Influence – this describes someone who is enthusiastic, trusting, optimistic, persuasive, talkative, impulsive and emotional
- Steadiness – this describes someone who is a good listener, team player, possessive, steady, predictable, understanding and friendly
- Compliance – this describes someone who is accurate, analytical, conscientious, careful, precise, meticulous and systematic.

Research has shown that behavioral characteristics can be grouped together in these four major divisions called personality styles. People with similar styles tend to exhibit behaviors in ways common to that style. Most individuals have a primary and secondary style but share these four styles in varying degrees of intensity.

To date, IML has assessed more than a million persons using the DISC and has trained more than 450,000 using this instrument.

**This supplement is designed to accompany the *Introduction to Behavioral Analysis Certification* binder and provides background information supporting the use of the DISC Personality instrument in a variety of settings. In line with William Marston's and IML's emphasis on accessibility and application, this manual is written in a format that is easy to read and understand, providing practical information on using the DISC as an assessment, training and personal development tool.**

## Uses of the assessment

The *DISC Personality System* is a quick self-report personality instrument that takes less than 10 minutes to complete. It consists of 24 questions, each with four descriptions. A person chooses which is 'Most' and which is 'Least' descriptive of themselves. Instructions are provided on how to self-score the instrument. Graphs are used to plot the results and show the profile of the person. The *Introduction to Behavioral Analysis* provides more useful information on how to interpret the results of the assessment.

The *DISC Personality System* can be used in organizational development, leadership development, training, team building, career planning, executive coaching, and conflict resolution. It can also be used, with prudence, in hiring situations. Given that hiring involves making a decision about people, there are a number of precautions that need to be taken, including:

- that there is an understanding of the limitations of the assessment and what the assessment measures,
- that the DISC profile is used in conjunction with other considerations of ability, qualifications, experience, reference checks, interviews and other suitable measures of fit with the job
- that the DISC profile is used to generate hypotheses about the person that are checked via a behavioral interview.

## Case study

### Training Program to Improve Leadership Effectiveness in the United States Air Force Academy

The United States Air Force Academy has incorporated the use of the DISC and related materials into its leadership training program for cadets since 2003. The mission of the Academy is to produce leaders of character. It emphasizes three primary core values: Integrity First; Service before Self; and Excellence in all that we do. The aim of the training program was to raise leadership effectiveness and build character by focusing on and improving organization, teamwork, interpersonal skills and personal influence.

To this end, IML produced a Team Leadership Package that included training materials consisting of the *Introduction to Behavioral Analysis* Certification binder, PowerPoint materials, an online report generator, and assessment booklets. These materials provided hands-on learning to train the trainer to be proficient in discovering team and individual strengths. It then focused on leveraging these strengths while helping in areas of possible limitations.

‘The leadership program is similar to programs that the Institute has been implementing in the business arena for 20 years,’ Dr. Bradley Smith, CEO of IML says. ‘But to us, it has more significance in that poor communication and motivation in a military situation can play a much bigger role than lost profits and business opportunities.’

IML designed the materials and worked with the Academy to make changes to the Academy’s initial Leaders in Flight Today (LIFT) program. A trainer’s guide and interactive presentation materials allowed the Academy to initiate the program easily.

‘I see improved morale, communication and a new energy gained by first understanding ourselves and then everyone else around us,’ says Major Jeff Kozyra, Deputy Division Chief, Character and Leadership Education and Program Director, LIFT Seminars at the Air Force Academy. ‘It has helped reduce conflict and has provided solutions by improving communication in a variety of areas where we work under conditions of stress.’

The LIFT program is currently run as a day-long offsite seminar for junior-level cadets. It is offered five times during the academic year. About 1000 cadets will participate in this program every year, most receiving their first exposure to the *DISC Behavioral Analysis*.

‘The young warriors really take to DISC,’ Major Kozyra says. ‘It is one of the highest rated segments of the day.’ And it seems to have a highly positive effect on the personal lives of the cadets as well, according to Major Kozyra. Several cadets made a point of telling him that they felt the LIFT Team Leadership program has already made a difference in how they relate to others outside the military environment. One said he planned to go home and spend more time with his family instead of just catching up on sleep and hanging out with friends. Another said he planned to call a sister whom he had not spoken to in two years. A third said that he was going back home to look up a former friend whom he had been avoiding to try and help him to turn his life around.

The Team Leadership Package works for several reasons. First, for future leaders to have the ability to understand others, they must be able to understand themselves. It also provides guidance in improving those skills. The Academy also recognizes that everyone needs motivation.

‘The LIFT program is just getting underway but it has already taken us further than I could have creatively imagined,’ said Major Kozyra. ‘The Institute is helping us achieve great levels of success with it. There is a new awareness of the value of the individual self. We believe this is the beginning of true leadership.’

# DEVELOPMENT OF THE DISC

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## Origins of the DISC

The *DISC Personality System* was inspired by and based on William Marston's book the *Emotions of Normal People*, a seminal work that was influenced by the works of Hippocrates and Carl Jung among others.

Dr. William Moulton Marston (1893–1947) leaves a vast legacy. He was a renowned lawyer and psychologist, invented an early form of the lie detector, created the DISC model of Personality, authored self-help books and created the popular Wonder Woman comics. He was a man ahead of his time in terms of his ideas and philosophies.

He was born in Cliftondale, Massachusetts, and obtained a law degree in 1918 and graduated from Harvard with a PhD in Psychology in 1921. After teaching at American University in Washington DC, Marston travelled to Universal Studios in California in 1929, where he spent a year as Director of Public Services.

Marston, though well respected by the psychological community, was often critical of their approach and set about developing tools that emphasized observable behavior and practical applications to everyday life. These tools were developed to increase motivation, understanding and adaptation of behavior.

The Marston DISC model has been in the public domain for many years now, and several publishers have developed universally accepted tools based on it that are valid and reliable for use in schools and the workplace.

IML was established in the same spirit in which Marston conducted his research: all of the work and theory is meaningless without practical application. Observable behavior patterns that can be predicted and adapted (depending on the environment), and understanding the motivation behind an individual's behavior are the hallmarks of all IML products. Because of this, IML has spent 20 years in developing versions of DISC that are easy to use and understand, that are universally accepted as valid and reliable, and yet require minimal training. All the guides and self-paced certification courses were developed with the end user in mind, focusing on practical knowledge that can be applied in everyday situations.

As you will see from the research information included in the Technical information section, research has also focused on the predictive ability of the DISC to achieve certain goals and attain measurable benefits in the classroom and workplace.

## Materials for organizations

The range of materials designed for organizations includes a self-paced certification binder, PowerPoint presentations, self-assessment booklets and workbooks. They are easy for HR practitioners, trainers and managers to adapt or incorporate into various development, team building or change management programs. The materials can be used in many situations, including:

- career planning
- conflict resolution
- personal and leadership development
- executive coaching
- counselling

### (a) Introduction to Behavioral Analysis

Training in the use of the DISC is required in order to purchase, administer and interpret the DISC materials. This training is available in the form of a self-paced certification binder containing:

- 4 Audio CDs presented by a very experienced Human Resource professional
- 76-page Certification Guide that is presented in the form of a workbook and follows the Audio CDs
- A Proficiency Exam, which is to be completed and sent in to IML
- 2 Personality Profiles
- 1 Children's Profile
- 1 Personality System Workbook

The certification program takes approximately 7–8 hours to complete and includes an open book exam that must be submitted for certification.

### **(b) DISC, TEAMS and Values Training CD-ROM**

This PowerPoint package contains 41 slides that can be used for team building, or integrated into other leadership development or organizational development programs. The product presents the DISC, TEAMS and Values profiles together as an integrated team-building system, giving an in-depth explanation of each profile. Each slide comes with audio by Dr. Bradley Smith. This presentation can be customized for use in various types of training and development programs. The standard program provides material for a half-day to one-day session.

### **(c) Understanding Your Personality Style PowerPoint Presentation**

This PowerPoint presentation on CD-Rom consists of 50+ slides that enable facilitators to run a two to three-hour session explaining the DISC Personality Style. Participants can follow using *The Personality System Workbook*.

### **(d) Personality System Profile | The Biblical Personality System Profile**

This comprehensive booklet contains a self-scorable personality styles assessment and is used to determine personality styles for use in counselling (marriage, family, pastoral and individual), human resource management and professional consulting. (The Biblical Profile adds Biblical character references.)

### **(e) The Personality System Workbook**

This expanded workbook is used by presenters of the Understanding Your Personality Style seminar. Attendees can follow and take notes in the workbook. This user-friendly, information-packed workbook has been enhanced to provide an interactive tool for seminar participants. (Note: there is not a profile contained in this booklet.)

### **(f) Values Style Profile**

The Values Style Profile helps us understand our internal value system that we use daily to make judgments about tasks, relationships, issues, events and goals. It contains the profile items, instructions for self-scoring as well as descriptions of different styles and profiles. Use the Values Style Profile in counselling, training and consulting situations. You can use the Values Style Profile in conjunction with the Personality System Profile and the TEAMS Profile as a complete battery for use in team building, relationship development, goal setting and career planning.

### **(g) TEAMS Profile**

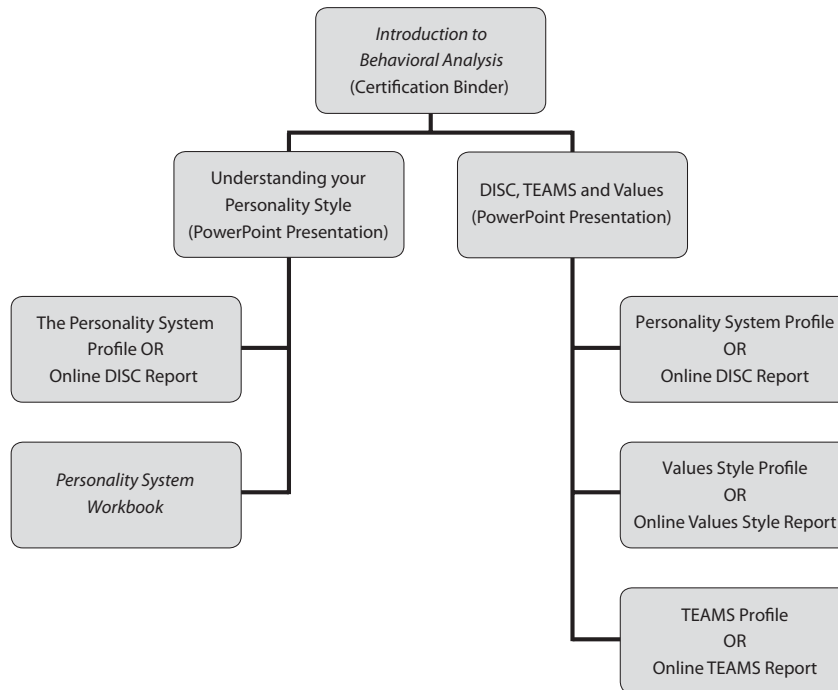
A corporate resource for team development, the results of the TEAMS Profile will give leaders the information required to strategically place each person in their best position to maximise effectiveness. It contains profile items, instructions for self-scoring and descriptions of each profile. It increases team members' understanding and appreciation of each other's talents, preferences, communication style, leadership qualities and challenge areas.

### **(h) PeopleKeys**

*PeopleKeys* is an integrated platform of DISC and online ability assessments and tools that provide an understanding of the strengths and weaknesses of individuals that can be used for hiring, training and retention. It contains job profiles for various roles, provides easy-to-read group reports for screening candidates and generates interview questions based on a person's profile.

Figure 1 following shows the interaction between the various parts of the materials for organizations. The *Introduction to Behavioral Analysis* is a program that certifies individuals in the use of the DISC and related materials for a variety of purposes. The PowerPoint presentations are also available to provide ready materials for the use of the DISC with groups. The Understanding Your Personality Style presentation can be used with the *Personality*



**Figure 1** Graphic Summary of Use of Materials

*System Profile* (or online DISC Report) and the workbook, which follows along with the presentation. The DISC, TEAMS and Values presentation is used with the DISC, Values and TEAMS paper or online reports to provide a more comprehensive overview for course participants.

## Materials for schools

StudentKeys is a series of short, accurate, self-scoring assessments designed to identify and enhance communication, learning, motivation and career choices in students. It is a simple program focusing upon personal ‘strengths’, then applying that information to everyday social, communication, decision-making and learning situations. These tools have been proven in independent university studies to be effective in retaining students, preparing them socially and academically, motivating them, and improving academic results. Each of the six topics consists of a Leader’s Guide for the facilitator and workbooks for students.

These assessments are valuable tools for educators and parents who want to:

- Recognize students’ learning styles and enhance learning
- Recognize students’ thinking styles and enhance thinking
- Reveal individual motivational needs and motivate students
- Develop effective study and test-taking skills in students
- Identify and encourage leadership qualities
- Help students appreciate diversity
- Identify individual communication styles and enhance communication
- Help students choose realistic goals
- Assist students in finding occupations that fulfil their individual needs
- Acclimatizing students to a different school
- Increase university retention rates\*
- Help raise students’ academic scores\*

\* An independent study in the United States has found that StudentKeys participants were retained from first to final year, 7 per cent more than the control group who were not exposed to StudentKeys materials. The same study found StudentKeys participants’ academic scores to be higher than those of control group participants (see the Eastern College study in the Technical information section).

### **(a) Leader's Guides for StudentKeys Workbooks**

Leader's Guides are recommended for the facilitator using StudentKeys workbooks in individual sessions or in the classroom. A Leader's Guide is available for each type of workbook to guide the facilitator through a one-hour session. The guides cover the entire workbook contents page by page as well as background theories, core concepts, tips on class exercises, ideas for group discussions, and suggestions on how to get the most out of the session.

### **(b) StudentKeys Training CD-Rom**

An easy-to-use, interactive Training CD-Rom is available as a supplement to the Leader's Guides for facilitators and mentors with no prior experience with StudentKeys materials. The CD features interactive menus, video, audio and graphics illustrating important concepts and implementation tips. Also included are creative discussion ideas and class exercises for making the most of students' self-discoveries.

### **(c) The Career Choice Workbook**

This 24-page assessment and workbook matches suggested careers with the user's personality styles (D, I, S and C). Users will learn 21st century workforce requirements and discover how their style is typically most fulfilled in an occupation.

### **(d) The Perceptual Learning Style Workbook**

This 12-page workbook identifies an individual's perceptual learning style, explaining the differences between the three perceptual styles (auditory, visual, kinesthetic) and offers tips to enhance learning.

### **(e) The Cognitive Thinking Style Workbook**

This 17-page workbook identifies an individual's cognitive thinking style, which is the preferences that individuals have for thinking, relating to others, and for various learning environments and experiences. The workbook assesses and explains the differences between the four cognitive styles (literal, intuitive, theoretical, experiential). It also offers tips to enhance learning, analysis of information, problem-solving and decision-making.

### **(f) The Values Style Workbook**

This 16-page workbook identifies an individual's personal values system, that is, how loyalty, personal freedom, equality, and justice impact on their professional and personal choices in life.

*The Values Style Workbook* is designed to help you discover your personal values. This would be useful in helping you identify what is most important to you, focus on certain life goals, motivate yourself, as well as grow to understand and appreciate differences in others.

### **(g) The Goal Setting Workbook**

Studies show those individuals who set goals will achieve overall better results than those individuals who do not set goals. The 16-page *Goal Setting Workbook* is packed with goal-setting/planning information, tips and exercises designed to assist you in achieving realistic goals. It will encourage you to design practical objectives for implementing your goals.

### **(h) The Personality Style Workbook**

This 16-page workbook includes a 15-question profile, an introduction to personality concepts and the study of personality characteristics (Behavioral analysis), as well as ways to enhance task completion, communication and relationships. It identifies an individual's personality style, helps explain the differences between people, provides a personal review of each individual's strengths and limitations, and works through an action plan to improve relationships.

# SCORING AND REPORTING

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## Paper and pencil

The DISC Personality System Analysis can be completed in a self-scorable booklet (*The Personality System, The Biblical Personality System*), which also provides descriptions of the various DISC-style combinations.

## Online entry and reports

The DISC, TEAMS and Values profiles can also be completed online in the PeopleKeys and MotivationalLiving.com systems. The online system generates a customized report that prints directly from the user's printer.

Different reports are available on separate platforms and include:

- reports for training and development purposes
- reports for selection purposes
- reports for personal and relationship growth

For queries, please contact:

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# TECHNICAL INFORMATION

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## Texas State University – DISC Personality System Validation Study

By Larry Price, PhD, Professor of Psychometrics and Statistics

### Study overview

The purpose of this study was to examine the psychometric properties of IML's *DISC Personality System Analysis*, specifically within the context of the workplace environment. Cohen and Swerdlik (2005) define personality assessment as 'the measurement and evaluation of psychological traits, states, values, interests, attitudes, worldview, acculturation, personal identity, sense of humour, cognitive behavior styles and related individual characteristics'. This offers the notion that personality is several dimensions. Hence, this study will use both classical psychometric analytic methods and newer approaches that are suitable for multidimensional constructs.

### Item development in relation to content validity

Items were developed based on the original theoretical work of William Marston, MD as published in the *Emotions of Normal People* (1928). The items on the IML DISC were developed to tap four latent dimensions of personality as espoused by Marston. Item content and wording was refined through an iterative procedure to allow for the maximum potential for tapping a particular construct or dimension. A balance was achieved between the number of items on the final scale as well as the amount and degree of redundancy the items exhibited. During the item development and refinement process, the IML development team displayed evidence of adhering to the Standards for Educational and Psychological Testing published by the American Educational Research Association (AERA), American Psychological Association (APA), and the National Council on Measurement in Education (NCME) (AERA, APA & NCME, 1999).

### Forced-choice item format

The forced-choice rating technique is used on the IML DISC where the subject responds to four sets of words or phrases and is required to select one of the four sets that MOST describes his/her behavior in the work environment and one of the four sets that LEAST describes his/her behavior.

Highland & Berkshire (1951) conducted an extensive study of forced-choice rating forms in connection with rating instructors. Their findings were that:

- highest reliability coefficients were attained when item formats were composed of four words or statements, two being favorable and two unfavorable; the rater selecting the most and the least descriptive.
- Evidence for the highest criterion validity was obtained when the item formats were composed of four words or statements.
- When item formats were composed of four words or statements, all favorable, the rater revealed the smallest evidence of response bias.

These findings provide psychometric support for the approach used in the IML DISC.

The participant's measurement is 'ipsative', meaning that the subject's responses and presumed strength of a measured trait are relative to the measured strengths of other traits in the same person. Hence, there is little normative or reference data in this manual for comparisons with others. Users of this type of scale have to be mindful of the underlying theoretical nature of the ipsative measurement and scoring approach so as to use the scores or classification information in an appropriate manner.

## Sample demographics

The primary goal of this study was to investigate the psychometric aspects of the IML DISC within the context of the workplace environment. Therefore, a purposive sampling strategy was employed for the data collection process.

The sample obtained was cross-sectional representing seven different regions of the United States in 26 separate locations. Specifically, represented in the sample are the northeast, Midwest, South, and Southwest regions of the United States. The breakdown of the sample by ethnicity and gender is shown in Tables 1 and 2.

**Table 1** Ethnic Composition of Sample

Ethnic Composition	Percentage of Sample
Caucasian	76
African-American	12
Hispanic	11
Asian/Pacific Rim	1

**Table 2** Percentage of Gender in the Sample

Gender	Percentage of Sample
Female	87
Male	13

Participants in the sample ranged from age 21 to 85; had attained a minimum of 12 years of formal education with most having 16 years. 331 survey instruments were completed and returned for analysis.

## Score and scale reliability

Reliability refers to the consistency and stability of scores obtained on a measurement instrument. These are represented by two measures:

- the examinee's true score on the underlying psychological construct;
- errors of measurement that represent the inaccuracy of measurement on a particular testing occasion or over time in a test–retest situation.

## Internal consistency

Internal consistency estimates of reliability represent how inter-related items are and how much they measure the same construct. Since the DISC has 4 different dimensions, intercorrelations are provided for each scale (see Table 3).

The Cronbach alpha is a measure of the internal consistency of items. A high Cronbach alpha (0.70–0.85) indicates that the items are all measuring one similar ability and are therefore, highly intercorrelated.

As seen in Table 3, the internal consistency of the DISC scales is very high, with a measure showing that just 14–24% of the variation in scores for each scale is due to error.

**Table 3** Subscale Reliability

Subscale	Cronbach Alpha	Std Error of Measurement
Dominance	0.84	3.16
Influence	0.70	4.29
Steadiness	0.73	4.00
Compliance	0.87	7.39

Note: Sample is composed of 200 subjects randomly selected from the total sample.

**Table 4** Spearman Correlation Coefficients for DISC subscales (N = 331)

Subscale	Dominance	Influence	Steadiness	Compliance
Dominance	--			
Influence	0.10	--		
Steadiness	-0.80**	-0.29**	--	
Compliance	-0.35**	-0.69**	0.23**	--

Note: \*\* Significant at  $p < 0.01$ .

Correlations between the DISC scales were also done to provide information about how distinct the scales are or how much they are related to each other. Given that they are meant to be measuring different, distinct scales, we do not expect the scales to be highly inter-correlated.

Coefficients below 0.35 reflect a 'low' degree of association; those between 0.36 and 0.65 reflect a 'moderate' degree of association and those above 0.65 reflect a 'high' degree of association. The '+' sign shows that it is a positive correlation, that is, as the value on one variable increases, the value on the other increases as well. The '-' sign shows a negative correlation in which value on one variable decreases as the other increases.

Based on the results in Table 4, the following conclusions can be made:

- Dominance has a moderate, negative relationship with Compliance.
- Dominance exhibits a strong, negative relationship with Steadiness.
- Influence has a strong, negative relationship with Compliance.

In other words, individuals who are high in Dominance or Influence tend to score lower on Compliance. This provides support for the personality types described, since individuals who are more dominant, direct and driven or influential, outgoing and flexible tend not to be highly controlled, compliant or perfectionistic.

## Validity

Validity refers to the degree to which tests measure what they claim to measure. In the case of IML's DISC, it is also linked to the theoretical framework proposed by William Marston.

### Content validity

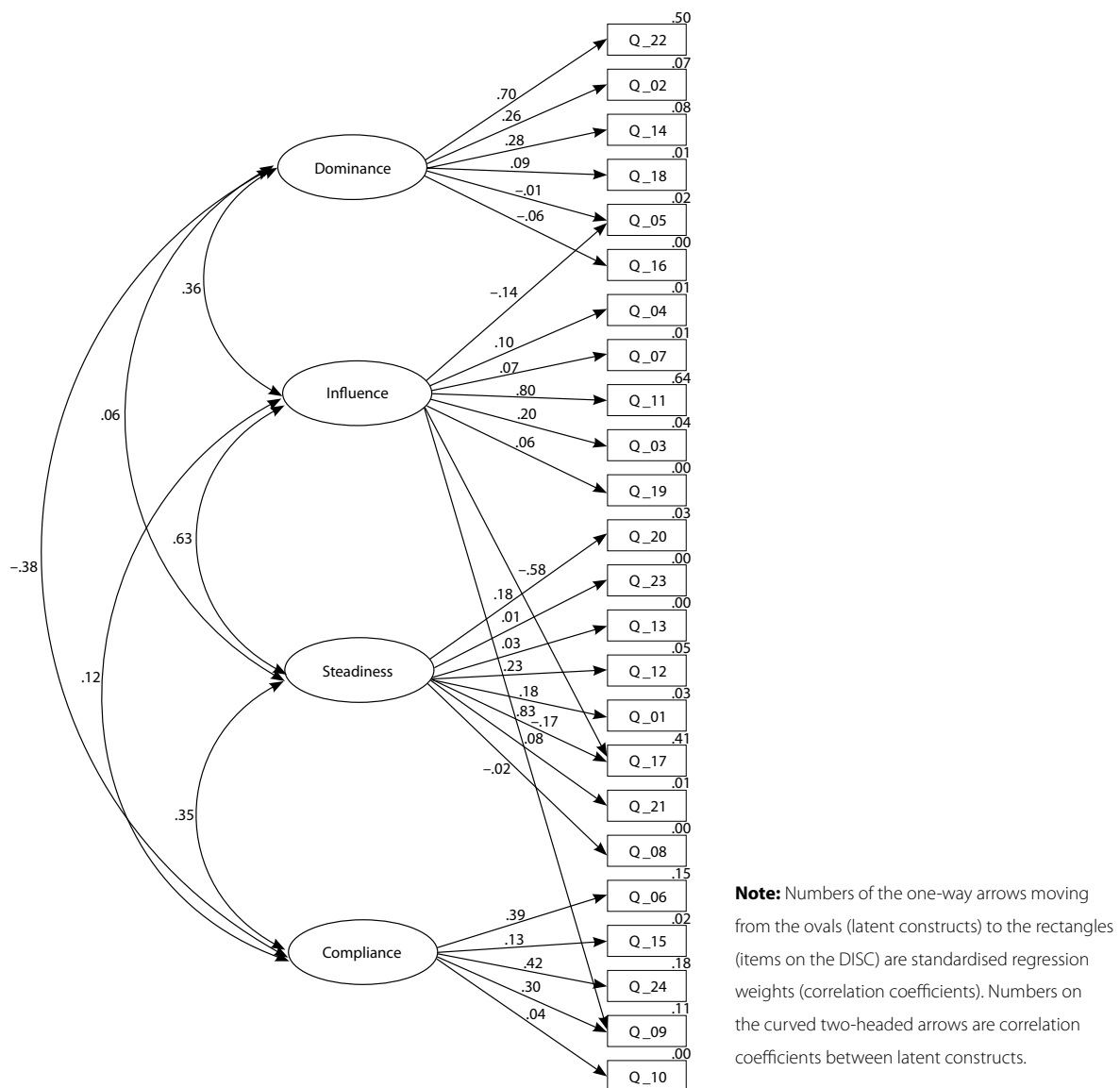
Content validity evidence refers to themes, words, item formats, tasks and guidelines for administration and scoring. Evidence for content validity was established by qualified experts at IML by compiling a series of statements and traits that are universally accepted as the basis for the four DISC styles. The descriptors and statements were also compared with other leading DISC publications of modern times to establish universal evidence of agreement for the 'core' observable behaviors or traits.

### Construct validity

This is a measure of how the subscales and items conform to the theoretical construct on which the proposed test score interpretations are based. Firstly, the DISC is multidimensional in nature and composed of four subscales representing a separate but correlated dimension of personality style. Hence, we want to investigate the factor structure of the IML DISC instrument in relation to Marston’s theoretical framework using the *Q – Technique*. This allows us to check how many factors are being measured by the items in the test and if all the items relate to one or more of the four DISC subscales.

The Q – Technique factor analysis method is particularly appropriate for the study of classifying individuals based on preferences or systems of typology – such as in personality assessment. Typically, Q – Technique studies employ a small number of subjects because we are more interested in the notion of ‘intra-individual differences’ (within subjects) rather than ‘inter-individual’ (between subjects) differences. As expected, analyses provided evidence of a four-factor dimensional structure underlying the IML DISC instrument. Across all analyses, an average of 70% of the total variance was explained by the four factor DISC model. As a general rule, the guidelines for the percentage of variance accounted for in a factor analytic model to be evaluated as ‘acceptable’ in the psychometric literature is 70%.

**Figure 2** The IML DISC Multidimensional Four-Factor Oblique Structural Equation Model



## Model estimation

Data on the four-factor structure of the DISC instrument were assessed using confirmatory factor analysis. After screening the data for multiple dimensions and finding this assumption tenable, the method of maximum likelihood was used to derive parameter estimates with all subsequent analyses performed on the covariance matrices. In order for a likely model to be identified, scales on each latent variable were established.

## Assessment of measurement models

Several fit indices were used as indicators for the goodness-of-fit of the DISC structural equation model. Fit indices used were: (a) the overall chi-square statistic; (b) the root mean square residual (RMR), a measure of error (c) the Akaike Information Criterion (AIC), (d) the root mean square error of approximation (RMSEA; Steiger, 1990), and (e) the goodness of fit index (GFI). For the four-factor DISC model evaluated herein, the following fit statistics were observed:

- (a)  $\chi^2$  (244,  $n=200$ )=272.65,  $p > .05$ . The  $\chi^2$  value shows that the data fits with the model.
- (b) RMR = .08. This value shows that there is an acceptably small error between the data and the implied model.
- (c) AIC = 348.67. This value shows that the data fits with the model
- (d) RMSEA = .02. The RMSEA provides values that represent the goodness-of-fit of the model if it were estimated in the population. RMSEA values between .05 and .08 are viewed as acceptable with values closer to zero indicating a more closely approximated model fit in relation to the population.
- (e) GFI = .90. The GFI have values ranging from 0 to 1 with values above .90 indicating a good fit of the empirical data to the implied model.

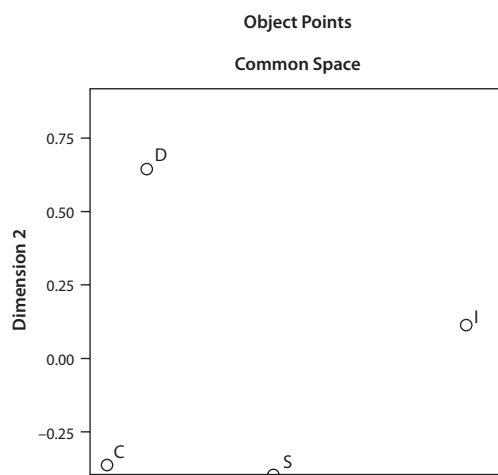
All the goodness-of-fit statistics show that the data fits with the postulated DISC model.

## Multidimensional scaling

Multidimensional scaling (MDS) is a multivariate statistical technique that helps researchers to identify key dimensions underlying individuals' responses. To accomplish this, MDS offers a scaling approach that allows for inferences about the underlying dimensions (in geometric space such as was posited in Marston's original work) from a series of similarity or preference judgments or statements. The results of MDS provide a map representing the respondent's perceived personality style.

Figure 3 below provides the MDS perceptual map obtained from this study. The perceptual map demonstrates that the four DISC dimensions are relatively removed from each other, and therefore, fairly distinct from one another, as posited in Marston's original theory.

**Figure 3** Perceptual Map of DISC Dimensions





## Specific problems associated with personality assessment inventories

There are a number of common problems associated with personality assessment which can affect the validity of individual profiles. However, this can often be minimized through professional feedback, interpretation and consultation including a discussion of the context within which the assessment occurs.

Problems include the following:

- false responding, due to uncooperativeness or wanting to project a favorable image.
- situational specificity, in which individuals tend to respond based on memories of most recent experiences or thoughts about how they would act in a specific situation rather than across a range of situations.

### False responding

IML's standard DISC administration procedure uses a timed approach, thereby reducing the propensity for participants to submit false responses on items or respond in a socially desirable manner. Some items are also framed negatively, which checks for the possibility of individuals intentionally skewing their results or responding in a particular way (e.g., checks 1 for the first answer in every item).

### Situational specificity

While a person's general characteristics remain the same, human behavior fluctuates within certain boundaries depending on the situation. Hence, when completing the DISC profile, you are asked to answer within the context of a certain environment (e.g., work or home). This is essential for a valid interpretation and understanding of scores.

### Conclusion

This study was designed to investigate the psychometric properties of the IML DISC instrument to validate its usefulness in a variety of situations. Collectively, the results prove that the IML DISC is a robust measure of personality style and can be used in schools or workplace environments to help individuals better understand their personality style.

## **Eastern College – A study of the validity of IML’s StudentKeys assessments: Freshman acclimatization and retention programs and the impact on First Year student success and retention**

By Laurie A. Schreiner, PhD, Professor and Chair of Psychology

IML’s StudentKeys tools were used as part of a self-administering and self-interpreting program designed to help students become better acclimatized to university by gaining a more thorough understanding of themselves. This program contained four modules focused on personality styles, learning styles and goal setting. It aims to retain students in university by assisting them to fit in, adjust to a new environment, improve their study habits, and set career, educational and personal development goals for the future.

### **Method**

325 First Year students at Eastern College participated in this study. Sixteen instructors were randomly assigned to one of two conditions:

- (a) Control Condition, where the instructor taught a three-credit course with a common syllabus that had been taught for the past four years. This course did not include sessions on career issues, personality styles or learning styles. This course utilizes a multi-faceted approach to wellness by looking at intellectual, socio-emotional and physical well-being.
- (b) IML StudentKeys Condition, where the instructors added four sessions using IML materials to the course taught by those in the control condition. Four workbooks were used in the study:
  - *The Personality Style Workbook*
  - *The Perceptual Learning Style Workbook*
  - *The Cognitive Thinking Style Workbook*
  - *The Career Choice Workbook*

Each workbook contained information for a 1 hour 20 minute session and included: (a) an introduction to the topic, (b) a self-assessment tool, (c) instructions for scoring and interpreting the profile, (d) an overview of the personality or learning styles, (e) more detailed descriptions of each particular style, (f) detailed suggestions for how to use the information and (g) exercises for students to complete to apply what they had learned. Leader’s guides were supplied to each instructor, containing suggestions for using material in the classroom.

Instructors received a full day of training by an IML StudentKeys trainer and had a leader’s guide to help them plan class activities. Evaluation forms were designed and administered to the students at the end of each IML StudentKeys session. Students rated their reactions on a 7-point scale. The results are given in Table 5.

### **Results**

Students were also asked to create a personal success plan to outline their strengths, weaknesses and established goals for their first year of university. As can be seen from Table 5, more of the students found that the session had dramatically increased their self-awareness, helped them gain an insight into others’ personality styles and how this impacted on their interactions. A large majority were also very positive about how useful, interesting and engaging the facilitator and materials were.

**Table 5** Student Responses to Personality Style Session

Item	Mean Rating	% Rating 1 or 2 (Very Low)	% Rating 6 or 7 (Very High)
I have a better understanding of the strengths and limitations of my personality style.	5.21	4	48
I have gained new insights about myself.	4.93	5.4	38
I can identify the personality styles of others.	5.07	4.4	42.7
I am aware of how other people's styles affect me.	5.03	2.6	36.7
I have received insights on how to relate to others who have different styles than my own.	5.00	4.7	38.6
The workbook was easy to use.	6.26	0.7	82.7
The material was easy to understand.	6.37	0.7	88.0
The content was interesting.	5.71	4.2	66.6
I enjoyed the material.	5.49	4.1	58.7
I liked learning about myself.	5.66	2.8	66.4
The professor made the class interesting.	6.19	0.0	82.6
The professor was enthusiastic about the material.	6.21	0.0	81.4

## Test–retest reliability

To assess for test–retest reliability of the IML materials, students' two highest styles on the Personality Style Assessment were recorded and these were compared to their responses on the same dimensions two weeks later.

49.3% of the students' styles remained exactly the same. 20.9% had the same top two styles, but in reverse order. 23.1% of the students had the same top style but their second style had changed, and 8.3% had no agreement in their styles over the two-week period. Overall, 72.4% of the students' top personality style remained constant and 20.9% changed their top style to become their second style.

## Validity

To test the predictive validity of the IML StudentKeys instruments and program, four major outcomes were looked at:

- improved study skills, leading to higher grades;
- better adjustment or acclimatization to university life;
- higher confidence in the ability to make career choices; and
- higher levels of student retention.

t-tests were used to find out if there was a statistically significant difference between StudentKeys participants and non-participants.

### (a) Improved study skills

After controlling for academic performance upon entry to university, an ANOVA indicated a significant difference in first semester Grade Point Averages (GPAs) between those who had gone through the StudentKeys program and those who had not ( $F=3.934$ ,  $p<0.05$ ). In the first semester, students who had participated in the program had a mean GPA of 2.85 and those who had not had an average GPA of 2.64. In the first year, StudentKeys participants had a cumulative GPA of 2.77 and non-participants had an average of 2.55.

**(b) Better adjustment to university life**

All participants were also asked to complete a Student Adaptation to University Questionnaire (SACQ) about two weeks after the last IML StudentKeys session. As shown in the table below, there was a slightly higher rating in each category, although statistically there were no significant differences.

**Table 6** Participant and Non-Participant Ratings on SACQ

SACQ Scale	StudentKeys Participants' Mean Score	Non-Participants' Mean Score	df	T
Academic Adjustment	145.4	143.7	228	0.44 (N.S.)
Attachment	107.7	107.0	228	0.25 (N.S.)
Personal/Emotional Adjustment	91.5	89.8	228	0.62 (N.S.)
Social Adjustment	137.3	134.4	228	0.81 (N.S.)
Full Scale	431.1	430.3	228	0.08 (N.S.)

Note: N.S. denotes a non-significant result.

**(c) High confidence in making career choices**

All participants also completed a rating on their confidence in making a career choice. While those who went through the StudentKeys program gave slightly higher ratings, these were statistically not significantly different from those who did not go through the program.

**Table 7** Participant and Non-Participant Ratings of Confidence in Making a Career Choice

Item	StudentKeys Participants' Mean Score	Non-Participants' Mean Score	df	t
In thinking about a career, I have examined my strengths and values.	5.34	5.27	270	0.36 (N.S.)
I know several career possibilities that may be optimal for me.	5.24	4.92	270	1.57 (N.S.)
In the process of thinking about what career might be a good option for me, I have thought about what things are most important to me.	5.53	5.32	270	1.18 (N.S.)
I feel confident when I think about deciding on a career and a major.	4.91	4.68	270	1.05 (N.S.)

Note: N.S. denotes a non-significant result.

**(d) Retention rates**

First-to-second year retention rates of IML StudentKeys participants were compared to the rates of non-participants using a Chi-Square Analysis. This showed a significant difference in retention rates between StudentKeys participants and non-participants. Further results are shown in Table 8.

**Table 8** Retention Rates of StudentKeys Participants and Non-Participants

Participation in StudentKeys Program	Number Retained	Retention %
Participants	118 of 155	76.1
Non-participants	111 of 170	65.3

## Predicted outcomes

Final course evaluations contained items which described possible outcomes for the course. A t-test was conducted to compare responses of IML StudentKeys participants to non-participants. As seen from the table, there were a number of significant differences in the responses of the two groups. IML StudentKeys participants were more likely to agree that they had learned to set realistic goals, understand their style of taking in information, identify their personality style, identify characteristics of their style of thinking, understand their learning style and adapt to classes that were not ideal for their thinking style.

**Table 9** Outcome Ratings of StudentKeys Participants and Non-Participants

Item	StudentKeys Participants' Mean Score	Non-Participants' Mean Score	df	t
I have learned to set realistic goals this semester as a result of this class.	4.82	4.37	269	2.21*
I understand my style of taking in and processing information.	5.26	4.73	269	2.76**
I recognize how to study in a way most helpful to my learning style.	4.97	4.82	270	0.83 (N.S.)
I have a better understanding of people who are different from me.	5.16	4.98	270	0.99 (N.S.)
I can identify my personality type or style.	5.59	5.17	270	2.19*
I can identify the environment in which I learn best.	5.43	5.14	270	1.60 (N.S.)
I can recognize personality types or styles different from my own.	5.13	5.07	270	0.32 (N.S.)
I know how to adapt to professors whose teaching style differs from my own learning style.	4.69	4.34	270	1.94 (N.S.)
I understand my strengths and challenges as a learner.	5.26	5.32	270	-0.37(N.S.)
I can identify others' style of thinking.	4.60	4.65	270	-0.29 (N.S.)
I know how to create an optimal learning environment for myself based on the way I process information.	4.64	4.69	270	-0.25 (N.S.)
I can identify characteristics of my style of thinking.	5.21	4.85	270	1.99*

I understand why different personality styles can come into conflict.	5.52	5.23	270	1.62 (N.S.)
I know my learning style.	5.62	4.94	270	3.51***
I know how to adapt to classes that are not ideal for my thinking style.	4.69	4.32	270	2.02*
I am aware of my strengths and weaknesses in relating to others.	5.35	5.28	270	0.41 (N.S.)

Note: N.S. = not significant; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$  (significant).

A t-test was also used to explore differences in instructor ratings between StudentKeys participants and non-participants. As seen in the table below, although instructors were randomly assigned to different conditions, StudentKeys participants rated their instructors significantly more positively in the areas of advising, availability when help was needed, helpfulness in discussing the personal success plan, enthusiasm for the course and overall quality of class discussions and activities.

**Table 10** Instructor Ratings for StudentKeys Participants and Non-Participants

Item	StudentKeys Participants' Mean Score	Non-Participants' Mean Score	df	t
The way the instructor taught the course.	5.52	5.18	270	1.75 (N.S.)
The total advising experience with your instructor.	5.68	4.65	270	4.45***
Your instructor's preparation for class.	5.96	5.69	270	1.57 (N.S.)
Your instructor's availability when you needed help.	6.03	5.46	270	2.95**
The helpfulness of your instructor in discussing your personal success plan.	5.64	5.17	270	2.23*
Your instructor's concern for your success.	5.75	5.54	270	1.10 (N.S.)
Your instructor's enthusiasm for the course.	5.99	5.48	270	2.81**
The overall quality of class discussions and activities.	5.70	4.54	270	5.99***

Note: N.S. = not significant; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

## Conclusion

The IML StudentKeys tool is a reliable and valid tool, when used to help students become acclimatized to university life, improve their study habits and achieve higher grades, become more confident in choosing a career and remain at the university.

The following outcomes were also achieved: participants in the StudentKeys course achieved significantly higher GPAs in their first semester and first year. They also showed a significantly higher rate of retention in university compared to those who had not been through the course.

While most student feedback was positive, there were some negative comments and suggestions for improvement. Quite a number of students did not enjoy the self-assessment process, regardless of which instrument was used. They also wanted more class time devoted to discussing the results of the assessments and their implications.

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The *DISC Technical Supplement* contains practical information and research data supporting the use of the DISC in personal, group and organizational development. It provides information about the development of the DISC, the use of the various materials and technical data. The research studies included in this supplement provide evidence of the psychometric properties of the DISC, validating its use in a variety of settings.

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