



## **Methods and Statistical Summary** **June 2013**

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This is the fourth update and revision to the LMAP Methods and Statistical Summary since 2006. The focus of this document is the analysis of personality and performance data collected 2010 – 2013.

In 2012, LMAP partnered with Brian S. Connelly, Ph.D. (currently a Professor at the University of Toronto and a research advisor to LMAP) to provide psychometrically-driven refinements to LMAP. Brian brings deep knowledge about personality theory and research and skills in psychometrics that allowed us at LMAP to examine the assessment data more thoroughly than ever before. This includes examining similarities and differences cross-culturally.

Using a normative dataset of 1,771 U.S. senior managers and executives (rated by 21,000+ raters – an average by 12 raters per target) who completed the LMAP 360, the internal consistency reliability, unidimensionality, and item alignment of each LMAP scale was evaluated. Additional samples from across North America, Europe, Asia (and specifically Singapore) and smaller samples from Australia and South America are also reported. In Brian's words,

*The LMAP scales were evaluated favorably as initially created (and revised over time), with some adjustments to again raise the empirical foundations on which LMAP is built and will be highlighted in this document. The Need for Achievement, Competitiveness, Hostility, Rigidity, Dependence, and Helpfulness scales also had strong reliability, but one to three items from these scales were repositioned because they empirically aligned better with other scales. The most substantial revisions were made to the Openness to Feedback scale, such that the scale now comprises a narrower set of items tightly clustered around how individuals receive and respond to criticism and feedback. On the whole, these modest psychometric revisions should produce scale scores and feedback that resonate more with LMAP clients.*

## **Overview**

*Character is more important than intellect.*

— Ralph Waldo Emerson

The **LMAP 360** is a leadership development assessment that provides reliable, valid and actionable multi-rater assessment feedback to senior managers and leaders. **LMAP** was developed within the context of a large, growing body of research that shows a complex of personality traits that are consistently associated with high performance and a distinct set of traits associated with decreased performance in management and leadership roles.

**LMAP** is a development tool: it is not designed for use in selection, placement, promotion, or salary decisions.

## Research Background

**LMAP** draws upon research from a wide body of research that demonstrates that specific behaviors facilitate management and leadership performance (High Performance Behaviors) and other specific behaviors interfere with performance (Counterproductive Behaviors):

- *Classic studies on leadership effectiveness in business settings* in writings by Bass (1981); Bennis (1985); Kanter (1983); Mintzberg (1973); Kotter (1988); Quinn (1988); Likert (1967); Stogdill (1963); Yukl (1988); Peters (1987); Kelley and Caplan (2002); Collins (2001)
- *Studies on the impact of personality on leadership, management and communications skills in aviation safety* by Ginnett (1986, 1989); Helmrich (1986, 1990); Chidester, Kanki, Foushee, (1990).
- *Research on the multiple intelligences* by Gardner (1993); Goleman (1995); Sternberg (1997).
- *Positive psychology* by Seligman (1993, 2004); Baker (2003); Buckingham and Coffman (1999).
- *Big 5 Personality Theory* by Robert Hogan, 1995, 1999; Paul Costa and Robert McCrae, 1994, 1998); Hoffman, 2002.
- *Circumplex Theory* by Leary (1954, 1957); Lafferty and Cooke (1971); Warren, Cooke, and Gratzinger (1991); Wiggins (1995); Plutchik and Conte (1997).

## **Circumplex Theory and Models**

It is from this last domain, Circumplex Theory, that the **LMAP** has its strongest roots. A circumplex is a two-dimensional model that describes expected relationships among a number of variables (Guttman, 1954). The measurement theory that has been applied to the interpersonal circle postulates that variables in the interpersonal domain are arranged into a circular array in two-dimensional space known as a circumplex (Guttman, 1954).

The **LMAP Profile** follows this tradition of a circular organization of the 13 traits measured whereby the most highly related traits (e.g. Rigidity and Need for Control; or Conscientiousness and Achievement Drive) are proximal and negatively related (orthogonal) traits are on opposite sides of the Profile (e.g. Rigidity and Openness to Feedback or Achievement Drive and Dependence). This circular design and the core of personality traits measured is something the **LMAP Profile** shares with other circumplex-based personality assessments, see below:

## The LMAP Profile compared to other circumplex-based personality assessments

<b>LMAP (2001, 2005, 2006)</b>	<b>Leary (1957)</b>	<b>Schaefer (1959, 61, 64)</b>	<b>Human Synergetics Lafferty (1971)</b>	<b>Wiggins Circumplex (1995)</b>
1. Helpfulness	Helpful/Nurturing	Democratic	Humanistic-Encouraging	Cooperative/Helpful
2. Sociable	Affiliation/Friendly	Cooperative	Affiliative	Sociable/Outgoing
3. Approval Seeking	Clinging/Self-Effacing	Accepting	Need for Approval	All-loving/Absolving
4. Dependent	Dependent	Protective-Indulgent	Dependence	Dependent/Self-Doubting
5. Tense/Stressed	Apologetic/Fearful	(none)	Avoidant	Abasive/Helpless
6. Hostility	Aggressive/Hostile	Authoritarian	Power	Controlling/Dictatorial
7. Rigid	Rebellious/Distrustful	Possessive	Oppositional	Suspicious/Rigid
8. Controlling	Aggressive/Hostile	Authoritarian	Power	Controlling/Dictatorial
9. Competitive	Competitive	(none)	Competitive	Competitive
10. Conscientiousness	Organizing/Ordering	Persistence	Perfectionism	(none)
11. Achieving	Assertive/Responsible	(none)	Achievement	Assured/Ambitious
12. Innovation	Independent	Imagination	Self-Actualization	Confident/Self – Reliant
13. Openness to Feedback	(none)	(none)	(none)	(none)

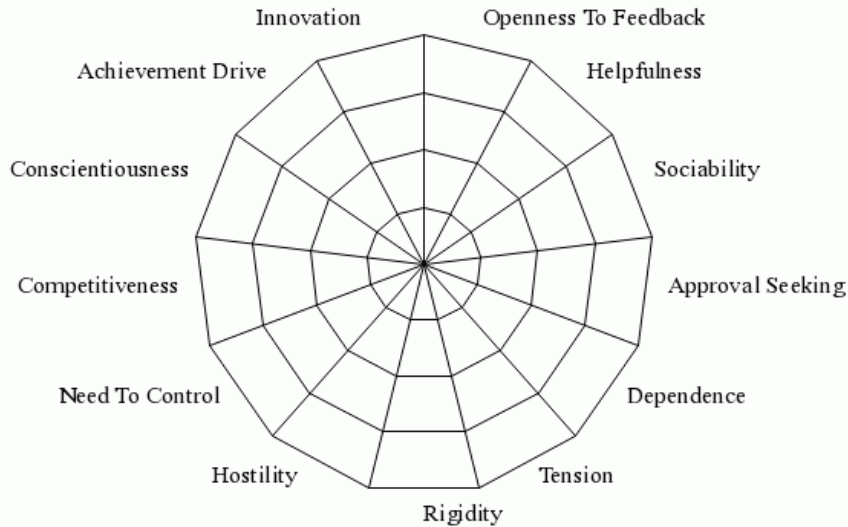
The **LMAP** measures traits are in mainstream of what other contemporary, *non*-circumplex-based personality assessments measure as well (see examples below). This reflects the high agreement in the field of psychology that there are ten to fifteen core personality traits in a personality profile. Though the names of traits may vary by instrument, many of the research-based, contemporary personality assessments have more similarities than differences.

## The LMAP compared to other non-circumplex-based personality assessments

<b>LMAP</b>	<b>Caliper Profile</b>	<b>Assess Personality</b>	<b>Edwards Inventory</b>	<b>Neo-Big 5 Personality</b>
1. Helpfulness	Empathy	Positive Abt People	Nurturance	Empathy/Consideration
2. Sociable	Sociability	Sociability	Affiliation	Warmth – Outgoing
3. Approval Seeking	Accommodation	Need to Be Liked	Succorance	Accommodation
4. Dependent	Self-Structure (low)	Self-Reliance (low)	Deference	Compliance (Deferent)
5. Tense/Stressed	Anxiety	Emotional Evenness	Abasement	Worry
6. Hostility	Aggressiveness		Dominance	
7. Rigid	Rigid / Flexible	Objectivity (low)	Change (low)	Rigid / Flexible
8. Controlling	Aggressiveness	Organized/Structure	Dominance	Assertiveness
9. Competitive	Ego Strength			Compliance/Competitive
10. Conscientiousness	Conscientiousness	Detail Interest	Order	Orderliness/Competence
11. Achieving	Assertiveness	Assertiveness	Achievement	Need to Achieve
12. Innovation	Idea Orientation	Structure (low)	Intrception	Imagination / Curiosity
13. Openness to Feedback	(none)	(none)	(none)	(none)

## The LMAP Profile

The **LMAP** Profile is a circumplex with 13 scales, each scale measuring a distinct personality trait. On the **LMAP** Profile, the center point equals zero and the four concentric circles mark the 25th, 50th, 75th, and 100th percentiles. Percentile scores allow for comparison of the participant's raw scores to those in the **LMAP** database. Traits with the longest/largest shaded areas have the greatest impact on behavior and smaller shaded areas have less influence on behavior.



## Early Research Samples

Development work on **LMAP** began in 1998 by Ronald Warren and continued while he was employed as the Director of 360 Assessments at Kenexa. From 1999 through 2003, four different samples of several hundred participants, each rated by four to eight co-workers, were collected and statistically analyzed to create and refine the assessment item sets and serve as the basis for initial reliability and validity studies. The following samples were collected and added to the database and helped to further refine the assessment:

- **In 2004** a sample of 887 target leaders, rated by 7 feedback raters was analyzed
  - Approximately 400 participants were commercial airline pilots using **LMAP** in an FAA-mandated crew-resource management program;
  - Approximately 200 participants were hospital executives in executive team-building and coaching programs;
  - Approximately 50 senior executives and 100 managers and individual contributors completed **LMAP** as part of a training program.
  - An additional sample of 48,768 self-assessments, collected in different application of the self-assessment in 2002, was also analyzed.
- **In 2006** a sample of 501 senior managers and executives – rated by 9 Feedback Raters – was added to the database.
- **In 2008**, a sample of 1013 senior managers and executives who completed **LMAP** during 2006 and 2007 (rated by an average of 12 Feedback Raters) was the basis for the statistical underpinnings of **LMAP** through mid-year 2013.

## Current Research Samples:

In 2012, **LMAP** partnered with Brian S. Connelly, Ph.D. (currently a Professor at the University of Toronto and a research advisor to **LMAP**) to provide psychometrically-driven refinements to **LMAP**. Using a normative dataset of 1,771 U.S. target leaders who had been rated on **LMAP**, the internal consistency reliability, unidimensionality, and item alignment of each **LMAP** scale was evaluated.

The following pages present a set of research findings examining properties of **LMAP**'s norms, reliability and validity. These findings are based on data extracted in January 2013 from **LMAP**'s normative database of employees who span across many organizations and continents. In total, this dataset contains **LMAP** scores from a total of 39,053 raters' descriptions of 3,064 target leaders. These target leaders provided self-ratings on **LMAP** and were in turn rated by (on average) 11.74 coworkers. Of the 2,705 target leaders providing information about their gender, the leaders were predominantly male (65%). 2,259 (73.73%) target leaders reside in North America, 381 (12.43%) reside in Asia, 339 (11.06%) reside in Europe, 36 (1.17%) reside in South America, 26 (.85%) reside in Australia, 17 (.55%) reside in the Middle East, and 4 (.13%) reside in Africa. Among the 39,053 observers providing ratings, 32% were Peers, 32% were Direct Reports, 13% were target leaders' Managers, 13% were Internal Clients, and 10% were external clients. The pages that follow use these data to compute **LMAP**'s norms, reliability statistics, convergence across rater categories, and validity for predicting effectiveness.

## Normative Information for LMAP Scales

Means and standard deviations were computed for both self-reports and (aggregated) observer-reports of the **LMAP** scales. Table 1 reports these means and standard deviations, separated by continent. These means and standard deviations for self- and observer-reports were used to calculate Cohen's  $d$ 's, which reflect the extent to which individuals rate themselves higher than they are rated by their coworkers on a given scale. For  $d$ 's, values around .20 or less are typically viewed as small, values around .50 are considered moderate, and values around .80 are viewed as large.

Although self-reports are generally believed to be inflated (because of self-enhancement), these data suggest that self-reports are generally more critical than ratings from peers (self-effacing). In North America, this self-effacement is most pronounced for traits that are less socially desirable: Approval Seeking, Tension, Rigidity, Hostility, Need for Control, and Competitiveness. For traits that are more socially desirable (Helpfulness, Sociability, Achievement Drive, Innovation, and Openness to Feedback), self-reports appear to be neither self-effacing nor self-enhancing. This pattern holds across Australian, European, and South American samples. However, in Asia, none of the **LMAP** scales produce a pattern of self-enhancement or self-effacement (perhaps because target leaders in collective cultures attend more closely to how they are perceived by the group when forming self-perceptions). Thus, although there are likely individual differences in self-enhancement, the overall trend in most of the world tends to be more toward self-effacement.

**Table 1: Means and Standard Deviations, by Continent**

Scale	U.S. only (N = 2,214)					All NA (N = 2,243)					Asia (N = 379)				
	Self-Report		Other-Report			Self-Report		Other-Report			Self-Report		Other-Report		
	M	SD	M	SD	<i>d</i>	M	SD	M	SD	<i>d</i>	M	SD	M	SD	<i>d</i>
Helpfulness	3.97	0.52	3.98	0.40	-0.02	3.97	0.53	3.98	0.41	-0.03	3.88	0.48	3.78	0.35	0.25
Sociability	3.93	0.56	3.96	0.41	-0.07	3.92	0.57	3.96	0.42	-0.07	3.79	0.51	3.72	0.36	0.14
Approval Seeking	2.95	0.73	2.52	0.34	0.75	2.94	0.73	2.52	0.34	0.75	2.82	0.67	2.73	0.37	0.17
Dependence	2.06	0.53	2.04	0.38	0.02	2.05	0.53	2.05	0.38	0.02	2.37	0.56	2.44	0.39	-0.15
Tension	2.19	0.56	1.98	0.39	0.43	2.19	0.56	1.99	0.39	0.43	2.33	0.52	2.25	0.35	0.17
Rigidity	2.13	0.50	2.00	0.39	0.29	2.13	0.50	2.00	0.39	0.29	2.24	0.50	2.26	0.32	-0.07
Hostility	2.06	0.55	1.82	0.43	0.48	2.06	0.56	1.82	0.43	0.47	2.25	0.56	2.19	0.43	0.13
Need for Control	2.10	0.55	1.97	0.47	0.27	2.11	0.56	1.97	0.47	0.27	2.33	0.57	2.39	0.45	-0.12
Competitiveness	2.38	0.63	2.20	0.43	0.33	2.38	0.63	2.20	0.44	0.33	2.65	0.57	2.68	0.41	-0.06
Conscientiousness	3.85	0.54	3.95	0.36	-0.23	3.85	0.54	3.95	0.36	-0.22	3.77	0.46	3.78	0.33	-0.02
Achievement Drive	4.10	0.50	4.04	0.39	0.13	4.10	0.50	4.04	0.40	0.13	3.79	0.53	3.74	0.39	0.12
Innovation	3.92	0.58	3.95	0.36	-0.06	3.92	0.59	3.95	0.37	-0.06	3.79	0.57	3.74	0.35	0.10
Openness to Feedback	3.48	0.86	3.49	0.78	-0.01	3.49	0.86	3.50	0.78	-0.01	3.22	0.92	3.21	0.74	0.01
Effectiveness	--	--	5.74	0.52		--	--	5.73	0.53		--	--	5.53	0.51	



Scale	Australia (N = 26)					Europe (N = 338)					South America (N = 36)				
	Self-Report		Other-Report			Self-Report		Other-Report			Self-Report		Other-Report		
	M	SD	M	SD	<i>d</i>	M	SD	M	SD	<i>d</i>	M	SD	M	SD	<i>d</i>
Helpfulness	3.73	0.44	3.83	0.43	-0.22	3.85	0.46	3.81	0.35	0.08	3.86	0.36	3.86	0.24	-0.01
Sociability	3.83	0.54	3.82	0.41	0.03	3.91	0.50	3.92	0.38	-0.01	3.86	0.47	3.87	0.26	-0.02
Approval Seeking	2.83	0.69	2.40	0.36	0.78	2.83	0.61	2.52	0.33	0.62	2.94	0.60	2.83	0.27	0.23
Dependence	2.12	0.38	2.05	0.29	0.21	2.08	0.44	2.10	0.30	-0.07	2.17	0.44	2.28	0.21	-0.33
Tension	2.30	0.58	2.07	0.36	0.48	2.14	0.48	2.06	0.30	0.20	2.51	0.48	2.26	0.28	0.64
Rigidity	2.38	0.42	2.14	0.40	0.58	2.20	0.45	2.14	0.36	0.15	2.14	0.43	2.15	0.24	-0.03
Hostility	2.24	0.63	1.91	0.39	0.62	2.19	0.51	2.01	0.36	0.40	2.09	0.50	1.85	0.27	0.59
Need for Control	2.28	0.53	2.07	0.42	0.46	2.44	0.49	2.37	0.40	0.16	2.39	0.46	2.30	0.32	0.23
Competitiveness	2.51	0.65	2.25	0.40	0.47	2.64	0.53	2.59	0.38	0.09	2.63	0.61	2.67	0.38	-0.06
Conscientiousness	3.64	0.46	3.78	0.30	-0.35	3.67	0.49	3.73	0.33	-0.15	3.73	0.36	3.85	0.25	-0.40
Achievement Drive	3.91	0.34	3.91	0.31	-0.02	3.95	0.41	3.91	0.29	0.11	3.98	0.42	3.94	0.23	0.13
Innovation	3.79	0.45	3.80	0.34	0.00	3.82	0.54	3.82	0.35	0.01	3.74	0.54	3.81	0.29	-0.15
Openness to Feedback	3.29	0.70	3.44	0.68	-0.21	3.56	0.78	3.54	0.67	0.02	3.81	0.47	3.75	0.36	0.14
Effectiveness	--	--	5.57	0.50		--	--	5.46	0.49		--	--	5.32	0.36	

*Note.* Positive *d*-values indicate that self-reports are higher than other-reports on the scale.

Table 2 presents means and standard deviations separately for men and women. In addition, Cohen's  $d$ -values are calculated both (a) within rater type to index gender differences and (b) within gender to index the difference between self- and observer-reports. Note first that gender differences are relatively small for both self-report and observer-reports. Men are slightly more Competitive ( $d = .47$  and  $.40$  for self- and observer-reports, respectively) and more Open to Feedback than women ( $d = .44$  and  $.49$ ). Finding that the gender differences for these two scales converge are similar whether self-reports or observer-reports are used suggests that these differences are likely actual trait differences rather than a reflection of stereotypes. However, most other scales produced negligible gender differences.

In addition, men and women show a similar pattern and magnitude in self-enhancement/self-effacement. That is, both men and women rate themselves higher on Approval Seeking, Tension, Rigidity, and Hostility than do their peers. Thus, the tendency toward self-effacement on socially undesirable traits appears similar across gender.

### **Reliability Analyses for LMAP Scales**

The core principle underlying reliability is consistency of measurement. Reliability can be indexed in multiple ways. In the case of **LMAP** scales, two forms of reliability are most appropriate: internal consistency reliability (which indexes the consistency of responses across items within a scale) and interrater reliability (which indexes the consistency of scale scores across raters). **LMAP** scales' reliability are discussed in turn for each type of reliability.

#### **Internal Consistency Reliability**

Table 3 shows the number of items for each scale and the internal consistency reliability (Cronbach's  $\alpha$ ) for both self-reports and for aggregated observer-reports<sup>1</sup>, separately by continent. Conventional standards (Nunnally, 1970) suggest that reliability statistics should exceed  $\alpha = .70$  for adequate reliability and  $\alpha = .80$  for strong reliability. For all but one scale, North American  $\alpha$ 's exceed standards for adequate reliability for self-reports and for strong reliability for observer-reports. (Dependence is the one exception, which falls close to these standards with  $\alpha = .66$  and  $\alpha = .69$  for self- and observer-reports, respectively). There is a consistent tendency for observer-reports to have stronger internal consistency reliability than self-reports. This is because observer-report scores for each item are averaged across all observers prior to computing these  $\alpha$ 's; this averaging substantially reduces the random error component of the item responses.

For target leaders residing outside North America, **LMAP** generally produced adequate reliability statistics for self-ratings and strong reliability statistics for aggregated observer ratings.<sup>2</sup> Not surprisingly, reliabilities for Asia, Australia, Europe, and South America were somewhat lower than North American samples. However, given that English was likely not many of these raters' first language, these reliability statistics generally appear quite strong.

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<sup>1</sup> Based on averaging items across raters.

<sup>2</sup> Caution is warranted in interpreting the reliability statistics for Australia and South America given the small sample sizes.

**Table 2: Means and Standard Deviations, by Gender**

Scale	Men (N = 1,748)					Women (N = 957)					Men - Women	
	Self-Report		Other-Report		Self-Obs d	Self-Report		Other-Report		Self-Obs d	Self-Report	
	M	SD	M	SD		M	SD	M	SD		d	d
Helpfulness	3.91	0.50	3.90	0.39	0.01	4.02	0.54	4.02	0.40	0.00	-0.21	-0.29
Sociability	3.93	0.56	3.97	0.39	-0.07	3.97	0.58	3.99	0.43	-0.04	-0.07	-0.06
Approval Seeking	2.93	0.69	2.55	0.36	0.69	2.91	0.74	2.55	0.34	0.63	0.04	0.02
Dependence	2.01	0.49	2.02	0.32	-0.01	2.07	0.55	2.08	0.42	-0.03	-0.10	-0.17
Tension	2.13	0.56	1.94	0.36	0.41	2.22	0.54	2.05	0.39	0.36	-0.17	-0.31
Rigidity	2.12	0.49	2.02	0.38	0.23	2.11	0.50	2.01	0.39	0.23	0.02	0.02
Hostility	2.06	0.57	1.82	0.43	0.48	2.07	0.55	1.89	0.44	0.37	-0.03	-0.17
Need for Control	2.21	0.56	2.09	0.49	0.24	2.11	0.58	2.02	0.50	0.17	0.17	0.13
Competitiveness	2.55	0.63	2.36	0.48	0.33	2.25	0.62	2.18	0.45	0.15	0.47	0.40
Conscientiousness	3.81	0.53	3.91	0.35	-0.22	3.91	0.54	3.99	0.38	-0.18	-0.18	-0.24
Achievement Drive	4.14	0.44	4.08	0.31	0.16	4.08	0.55	4.02	0.44	0.11	0.13	0.16
Innovation	3.89	0.58	3.89	0.36	0.01	3.87	0.61	3.94	0.37	-0.14	0.04	-0.15
Openness to Feedback	3.75	0.60	3.75	0.48	0.01	3.41	0.92	3.42	0.83	0.00	0.44	0.49
Effectiveness	--	--	5.65	0.53		--	--	5.72	0.55			-0.12

*Note.* Positive values for self – observer *d*'s indicate that self-reports are higher.

Positive values for gender difference *d*'s indicate that men are higher.

**Table 3: Internal Consistency Reliability for Self and Aggregated Observers, by Continent**

Scale	# Items	U.S. only (N = 2,214)		All NA (N = 2,243)		Asia (N = 379)		Australia (N = 26)		Europe (N = 338)		South America (N = 36)	
		Self- Report	Other- Report	Self- Report	Other- Report	Self- Report	Other- Report	Self- Report	Other- Report	Self- Report	Other- Report	Self- Report	Other- Report
Helpfulness	10	0.84	0.96	0.84	0.96	0.80	0.93	0.83	0.96	0.80	0.93	0.67	0.86
Sociability	10	0.79	0.83	0.80	0.83	0.77	0.79	0.73	0.82	0.77	0.83	0.60	0.78
Approval Seeking	7	0.85	0.89	0.85	0.89	0.80	0.87	0.91	0.92	0.77	0.86	0.75	0.77
Dependence	9	0.66	0.68	0.66	0.69	0.65	0.68	0.34	0.59	0.51	0.57	0.60	0.57
Tension	10	0.77	0.82	0.77	0.82	0.72	0.78	0.82	0.82	0.72	0.76	0.68	0.81
Rigidity	10	0.71	0.84	0.71	0.84	0.67	0.75	0.50	0.83	0.62	0.79	0.66	0.65
Hostility	9	0.73	0.81	0.73	0.81	0.69	0.78	0.78	0.79	0.65	0.76	0.72	0.79
Need for Control	10	0.82	0.96	0.82	0.96	0.80	0.93	0.85	0.96	0.73	0.91	0.69	0.86
Conscientiousness	13	0.80	0.80	0.81	0.81	0.70	0.77	0.78	0.76	0.77	0.79	0.62	0.78
Competitiveness	9	0.75	0.82	0.75	0.82	0.65	0.74	0.80	0.83	0.64	0.80	0.79	0.92
Achievement Drive	14	0.80	0.84	0.81	0.84	0.82	0.86	0.60	0.78	0.74	0.80	0.76	0.81
Innovation	9	0.89	0.95	0.89	0.96	0.88	0.94	0.84	0.95	0.86	0.93	0.87	0.93
Openness to Feedback	6	0.89	0.96	0.89	0.96	0.89	0.96	0.78	0.92	0.85	0.93	0.63	0.86
Effectiveness	5	--	0.94	--	0.95	--	0.94	--	0.93	--	0.92	--	0.90

*Note.* N = total number of target leaders rated.

## **Interrater Reliability**

Table 4 reports the interrater reliability coefficients as intraclass correlations, both separated by rater category and as a combination of all rater categories. Two types of intraclass correlations are reported. ICC(1,1) values reflect the consensus correlation that would be observed between two raters within a given category (e.g., the correlation between two different peers' ratings of a target), and these values are useful for comparing the reliability of different rater types. ICC(1,*k*) values reflect how reliable a score is once it has been averaged across raters. Because averaging across raters improves reliability, ICC(1,*k*) values are consistently larger than ICC(1,1) values.

Compared to meta-analytic research (Connelly & Ones, 2010; Kenny, Albright, Malloy, & Kashy, 1994), the interrater reliability values in Table 4 are quite high. Whereas most previous studies have found that interrater reliabilities are only marginally larger for colleagues than they are for strangers, the interrater reliabilities for **LMAP** scales approach and even exceed reliabilities for family members or friends. External clients tend to be the most reliable rating group (perhaps because they observe target leaders in a set of very narrow but strongly overlapping situations). Openness to Feedback tends to be the most reliably rated scale, whereas Approval Seeking (a highly internal trait) tends to be the least reliably rated scale.

The ICC(1,*k*) values generally exceed .80 within rater group and even .90 when raters are combined across groups. This suggests that the process of averaging **LMAP** scales across items and across raters produces highly reliable measures of the relevant personality traits.

### **Do Different Perspectives Offer Similar Views of Target leaders?**

**LMAP** solicits ratings from many different perspectives, using ratings from peers, Direct reports, managers, internal clients, external clients, and the target leaders themselves. Thus, an important question is the extent to which raters from different categories converge in their perceptions of target leaders (i.e., does a target look just as helpful when around their manager as when around their Direct reports).

First, we examined the extent to which observer-reports correlated with self-reports (see Table 5). Note that for all **LMAP** scales, Table 5 shows positive (and generally strong) correlations between self- and observer-reports. This pattern of strong, positive correlations holds regardless of the relationship that observers have to target leaders, such that peers, Direct reports, managers, internal clients, and external clients all have some accurate and valid insight into target leaders' personalities. Openness to Feedback, Achievement Drive, Dependence, Sociability, and Competitiveness show the strongest self-observer correlations, indicating that observer-reports are likely most accurate for these traits. These traits tend to be those that are most visible to observers. Effectiveness, Approval Seeking, Innovation, and Helpfulness show the weakest self-observer correlations, though even these correlations are still moderately strong and positive. These traits tend to be those that are the most internal and/or the most socially desirable, suggesting that these accuracy correlations may be affected by observers' difficulty observing the traits or by self-reports' self-serving blind spots.

**Table 4: Interrater Reliabilities, by Rater Type**

	All Rater Groups		Peers		Direct Reports		Managers		Internal Clients		External Clients	
	(N = 3,045)		(N = 2,681)		(N = 2,648)		(N = 1,041)		(N = 1,122)		(N = 849)	
	<u>k = 12.83</u>		<u>k = 4.49</u>		<u>k = 4.6</u>		<u>k = 1.68</u>		<u>k = 3.54</u>		<u>k = 3.65</u>	
	ICC(1,1)	ICC(1,k)	ICC(1,1)	ICC(1,k)	ICC(1,1)	ICC(1,k)	ICC(1,1)	ICC(1,k)	ICC(1,1)	ICC(1,k)	ICC(1,1)	ICC(1,k)
Helpfulness	0.37	0.88	0.50	0.82	0.48	0.81	0.59	0.71	0.49	0.62	0.53	0.80
Sociability	0.44	0.91	0.56	0.85	0.53	0.84	0.62	0.73	0.59	0.70	0.65	0.87
Approval Seeking	0.26	0.82	0.41	0.76	0.41	0.76	0.55	0.67	0.42	0.54	0.43	0.74
Dependence	0.47	0.92	0.56	0.85	0.58	0.86	0.66	0.77	0.61	0.73	0.69	0.89
Tension	0.41	0.90	0.52	0.83	0.55	0.85	0.63	0.74	0.56	0.68	0.66	0.88
Rigidity	0.40	0.90	0.51	0.83	0.53	0.84	0.64	0.75	0.53	0.65	0.64	0.87
Hostility	0.42	0.90	0.53	0.84	0.55	0.85	0.63	0.74	0.58	0.70	0.65	0.87
Need for Control	0.41	0.90	0.53	0.83	0.53	0.84	0.63	0.74	0.54	0.66	0.55	0.82
Conscientiousness	0.43	0.91	0.54	0.84	0.53	0.84	0.64	0.75	0.56	0.68	0.59	0.84
Competitiveness	0.42	0.90	0.54	0.84	0.53	0.84	0.65	0.76	0.55	0.67	0.59	0.84
Achievement Drive	0.52	0.93	0.61	0.88	0.62	0.88	0.69	0.79	0.63	0.74	0.75	0.92
Innovation	0.31	0.85	0.46	0.79	0.43	0.78	0.58	0.70	0.46	0.59	0.51	0.79
Openness to Feedback	0.67	0.96	0.71	0.92	0.75	0.93	0.78	0.86	0.77	0.85	0.83	0.95
Effectiveness	0.27	0.82	0.46	0.79	0.41	0.77	0.61	0.73	0.42	0.55	0.50	0.78

*Note.* N = Number of target leaders rated by two or more raters within a given category; k = average number of raters per target in the overall dataset; ICC(1,1) = Intraclass correlation type I for a single rater; ICC(1,k) = intraclass correlation type I for the aggregated number of raters based on Spearman-Brown's prophecy formula.

**Table 5: Correlations between Self-Reports and Observer-Reports, Separated by Rater Category**

Scale	Aggregate (N = 3,062)	Peer (N = 2,884)	DR (N = 2,808)	Mng (N = 2,743)	ICL (N = 1,345)	ECL (N = 1,082)
Helpfulness	0.47	0.39	0.37	0.33	0.31	0.33
Sociability	0.56	0.48	0.46	0.41	0.45	0.45
Approval Seeking	0.35	0.27	0.26	0.22	0.23	0.17
Dependence	0.62	0.54	0.55	0.50	0.54	0.56
Tension	0.47	0.40	0.40	0.36	0.36	0.39
Rigidity	0.48	0.38	0.39	0.36	0.38	0.40
Hostility	0.47	0.42	0.40	0.34	0.37	0.31
Need for Control	0.47	0.40	0.39	0.35	0.35	0.35
Conscientiousness	0.51	0.43	0.44	0.38	0.40	0.30
Competitiveness	0.55	0.45	0.46	0.41	0.42	0.43
Achievement Drive	0.70	0.60	0.63	0.58	0.63	0.66
Innovation	0.40	0.33	0.29	0.28	0.22	0.25
Openness to Feedback	0.82	0.75	0.77	0.73	0.79	0.80
Effectiveness*	0.23	0.19	0.15	0.13	0.20	0.32

\* For Effectiveness, self-ratings were available for only 233 target leaders.

*Note.* Aggregate = Average across all rater categories; Mng = Manager; DR = Direct Reports; ICL = Internal Client; ECL = External Client.

N = number of target leaders rated. Raters are averaged within categories prior to correlating across categories. On average, target leaders were rated by 4.49 peers, 4.60 Direct reports, 1.68 managers, 3.54 internal clients, and 3.65 external clients.

Second, we examined the extent to which observers with different relationships with the target provided consistent ratings. Table 6 shows the intercorrelations across peers, Direct reports, managers, internal clients, and external clients. Again, there is a consistent pattern of positive and strong correlations across relationships. This suggests that there is strong consistency in the way target leaders are perceived, regardless of whether they are interacting with their managers, Direct reports, peers, or clients. However, these cross-relationship correlations are somewhat weaker than the intraclass correlations in Table 4. This suggests that although different types of raters converge in their perceptions of target leaders, peers, Direct reports, managers, and clients each have some unique insights into target leaders' traits. Openness to Feedback, Achievement Drive, Dependence, and Sociability tend to have the strongest cross-observer correlations, consistent with these traits tending to be most accurately perceived.

Although all combinations of raters produced strong correlations, the combination of internal and external clients produced the strongest cross-observer correlations. This suggests that individuals perhaps have a particularly unique way of behaving with clients that stands out from the way they behave with coworkers. Thus, the perceptions that clients have of target leaders may be especially meaningful and distinct from the insight that coworkers can offer.

On the whole, these analyses suggest strong convergence across the perspectives of self-ratings, peers, Direct reports, managers, internal clients, and external clients. Though each relationship may engender some unique insights about target leaders, there is strong enough convergence across these diverse types of relationships to conclude that (a) there is general consistency in the way target leaders behave across relationships and (b) these different coworkers are capable of forming accurate impressions of target leaders.

### **Intercorrelations Across LMAP Scales**

Table 7 provides intercorrelations the 13 **LMAP** scales, along with Effectiveness ratings. Note that the pattern of intercorrelations among the **LMAP** scales generally conforms to the two-dimensional circumplex model from which the scales were theoretically derived. Whether examining self-reports or ratings aggregated across observers, scales tend to correlate strongly and positively with those scales nearby on the circumplex (e.g., Helpfulness-Sociability or Rigidity-Hostility). In addition, scales correlate strongly and negatively with those scales located in the opposite quadrants of the circumplex (e.g., Dependence-Achievement Drive, Helpfulness-Hostility). On the whole, this pattern of correlations provides indirect support of the mapping of **LMAP** scales along the circumplex.



**Table 6: Correlations Across Rater Categories**

Scale	Peer-DR (N = 2,672)	Peer-Mng (N = 2,613)	Peer-ICL (N = 1,284)	Peer-ECL (N = 1,033)	DR-Mng (N = 2,548)	DR-ICL (N = 1,225)	DR-ECL (N = 996)	Mng-ICL (N = 1,234)	Mng-ECL (N = 959)	ICL-ECL (N = 577)
Helpfulness	0.48	0.47	0.43	0.41	0.43	0.43	0.36	0.35	0.35	0.69
Sociability	0.58	0.55	0.55	0.59	0.50	0.59	0.54	0.48	0.49	0.71
Approval Seeking	0.39	0.32	0.31	0.28	0.29	0.32	0.26	0.28	0.31	0.62
Dependence	0.65	0.58	0.63	0.67	0.57	0.66	0.65	0.56	0.60	0.77
Tension	0.57	0.52	0.55	0.55	0.47	0.57	0.54	0.51	0.52	0.70
Rigidity	0.53	0.49	0.50	0.53	0.46	0.52	0.49	0.45	0.47	0.65
Hostility	0.58	0.51	0.57	0.53	0.47	0.55	0.48	0.51	0.48	0.69
Need for Control	0.55	0.52	0.51	0.48	0.49	0.48	0.41	0.45	0.42	0.71
Conscientiousness	0.59	0.53	0.52	0.47	0.50	0.53	0.44	0.45	0.40	0.64
Competitiveness	0.55	0.54	0.56	0.56	0.48	0.55	0.48	0.44	0.48	0.67
Achievement Drive	0.67	0.64	0.67	0.72	0.63	0.71	0.72	0.62	0.65	0.78
Innovation	0.40	0.42	0.39	0.39	0.35	0.38	0.32	0.34	0.32	0.68
Openness to Feedback	0.81	0.77	0.83	0.84	0.77	0.84	0.85	0.78	0.81	0.92
Effectiveness	0.35	0.39	0.36	0.35	0.30	0.31	0.33	0.32	0.35	0.66

*Note.* Sup = Supervisor; DR = Direct Reports; ICL = Internal Client; ECL = External Client. N = number of target leaders rated.

Raters are averaged within categories prior to correlating across categories.

On average, target leaders were rated by 4.49 peers, 4.60 direct reports, 1.68 managers, 3.54 internal clients, and 3.65 external clients.

**Table 7: Intercorrelations among LMAP Scales for Self and Aggregated Observers**

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Helpfulness		0.58	0.21	-0.03	-0.24	-0.44	-0.44	-0.43	-0.21	0.36	0.28	0.32	0.15	--
Sociability	0.68		0.11	-0.35	-0.33	-0.43	-0.29	-0.14	0.06	0.31	0.54	0.44	0.37	--
Approval Seeking	0.24	0.22		0.36	0.35	0.11	0.10	0.07	0.17	0.03	-0.07	-0.10	0.00	--
Dependence	-0.05	-0.48	0.40		0.52	0.36	0.24	0.02	0.02	-0.26	-0.68	-0.32	-0.52	--
Tension	-0.37	-0.53	0.31	0.68		0.60	0.56	0.30	0.16	-0.19	-0.47	-0.21	-0.45	--
Rigidity	-0.64	-0.64	-0.02	0.43	0.75		0.62	0.50	0.25	-0.22	-0.42	-0.18	-0.54	--
Hostility	-0.64	-0.55	-0.01	0.39	0.73	0.80		0.60	0.40	-0.22	-0.28	-0.07	-0.37	--
Need for Control	-0.75	-0.38	-0.01	0.05	0.44	0.67	0.77		0.57	-0.02	0.02	0.03	-0.08	--
Conscientiousness	-0.50	-0.16	0.19	0.11	0.34	0.45	0.62	0.79		-0.01	0.09	0.12	-0.02	--
Competitiveness	0.35	0.33	-0.10	-0.46	-0.40	-0.38	-0.36	-0.16	-0.21		0.53	0.21	0.25	--
Achievement Drive	0.27	0.62	-0.15	-0.84	-0.66	-0.53	-0.45	-0.09	-0.06	0.67		0.46	0.65	--
Innovation	0.38	0.47	-0.14	-0.35	-0.26	-0.26	-0.14	-0.11	0.01	0.31	0.49		0.12	--
Openness to Feedback	0.21	0.57	0.02	-0.69	-0.71	-0.65	-0.60	-0.18	-0.14	0.43	0.76	0.10		--
Effectiveness	0.61	0.53	-0.08	-0.29	-0.37	-0.43	-0.35	-0.37	-0.19	0.48	0.45	0.62	0.15	

*Note.* Correlations above the diagonal are for self-report scores ( $N = 3,062$ ); correlations below the diagonal are for aggregated observers ( $N = 3,045$ ).

## **LMAP Scales' Relations with Performance**

Finally, we examined which **LMAP** traits support individuals' effectiveness and which **LMAP** traits deter individuals from effective performance. Table 8 presents the correlations between **LMAP** scales and overall observer-rated effectiveness, separated by (a) gender and (b) self- vs. observer-rated **LMAP** scales. These findings indicate that individuals who are more Innovative, Helpful, Sociable, Achieving, and Conscientious tend to be more effective. In contrast, individuals who are more Rigid, Tense, Hostile, Need for Control, and Dependent tend to be less effective. The effects were weaker for Openness to Feedback (modest positive correlations), Approval Seeking, and Competitiveness (modest negative correlations).

There were also marked differences in the strength of the predictive validities for self-reports and observer-reports of the **LMAP** scales, with the observer-reports showing stronger prediction. This difference likely stems from three factors: (1) observer-report scores for **LMAP** scales were averaged across multiple raters, whereas self-reports of **LMAP** could use only a single rater, (2) the same observers who rated **LMAP** scales also rated effectiveness, meaning that observer-report validities may be somewhat inflated by shared method variance, and (3) as shown by two meta-analyses (Connelly & Ones, 2010; Oh, Wang, & Mount, 2011), observer-reports tend to be stronger predictors of job performance than are self-reports. This final explanation is perhaps the most interesting. In fact, in separate analyses, even when the validity of self-reports of **LMAP** was compared to the validity of a randomly selected peer (whose effectiveness rating was omitted from the criterion average), the validity of the observer-reported **LMAP** traits were stronger. Thus, when it comes to predicting individuals' effectiveness, coworkers seem to have clearer insights about our personality traits than we do ourselves.

The pattern of correlations was generally consistent for men and for women whether observer-reports or self-reports were used to measure traits. This suggests that the personality traits that make for an effective man at work do not differ from those that make for a successful woman at work.

## **Analyses Controlling for Shared Method Variance**

Because each observer rated both effectiveness and **LMAP** scales, we wanted to ensure that the strong validities for **LMAP** displayed in Table 8 do not arise from common method variance. We used structural equations modeling to control for these confounding effects (the technical appendix provides details on the models ran). Table 9 provides results describing model fit, factor loadings, and, most importantly, the validity ( $\square_{\text{perf}}$ ) for each trait for predicting overall effectiveness. Note that the strong predictive power of the **LMAP** traits remain after controlling for shared method variance. Specifically, individuals who are Helpful, Innovative, Sociable, Conscientious, and Achieving make for the most effective employees. In addition, individuals who are Rigid, Tense, in Need of Control, and Hostile make for the least effective employees.

**Table 8: Comparing Correlations with Overall Effectiveness Across Men and Women**

Scale	Self-Report		Observer-Report	
	Men	Women	Men	Women
Helpfulness	0.16	0.20	0.57	0.65
Sociability	0.14	0.21	0.54	0.57
Approval Seeking	0.01	0.05	-0.10	-0.09
Dependence	-0.06	-0.12	-0.40	-0.29
Tension	-0.10	-0.04	-0.47	-0.38
Rigidity	-0.05	-0.06	-0.49	-0.44
Hostility	-0.06	-0.10	-0.35	-0.41
Need for Control	-0.05	-0.03	-0.36	-0.38
Competitiveness	0.02	-0.02	-0.15	-0.24
Conscientiousness	0.08	0.17	0.44	0.51
Achievement Drive	0.13	0.20	0.63	0.45
Innovation	0.07	0.12	0.59	0.64
Openness to Feedback	0.01	0.05	0.38	0.11

**Table 9: SEM Model Fit, Factor Loadings, and Relationships with Overall Effectiveness, Controlling for Correlated Errors within Raters**

Scale	Model Fit				Factor Loadings					
	$\chi^2$	<i>df</i>	CFI	RMSEA	$\square$	$\lambda_{\text{self}}$	$\lambda_{\text{peer}}$	$\lambda_{\text{DR}}$	$\lambda_{\text{mng}}$	$\gamma_{\text{perf}}$
Helpfulness	502.32	162.00	0.98	0.03		0.54	0.56	0.56	0.53	<b>0.61</b>
Sociability	450.22	162.00	0.98	0.02		0.63	0.62	0.62	0.59	<b>0.51</b>
Approval Seeking	342.87	162.00	0.96	0.02		0.43	0.43	0.44	0.42	<b>-0.07</b>
Dependence	361.25	162.00	0.98	0.02		0.67	0.63	0.64	0.64	<b>-0.28</b>
Tension	418.78	162.00	0.98	0.02		0.52	0.58	0.61	0.55	<b>-0.40</b>
Rigidity	420.47	162.00	0.98	0.02		0.53	0.57	0.59	0.56	<b>-0.46</b>
Hostility	426.51	162.00	0.98	0.02		0.53	0.60	0.61	0.56	<b>-0.38</b>
Need for Control	484.52	162.00	0.97	0.03		0.52	0.59	0.59	0.59	<b>-0.39</b>
Competitiveness	445.92	162.00	0.98	0.02		0.57	0.61	0.61	0.59	<b>-0.20</b>
Conscientiousness	398.31	162.00	0.97	0.02		0.61	0.60	0.60	0.59	<b>0.46</b>
Achievement Drive	499.02	162.00	0.98	0.03		0.75	0.67	0.70	0.66	<b>0.43</b>
Innovation	517.40	162.00	0.97	0.03		0.47	0.50	0.46	0.49	<b>0.59</b>
Openness to Feedback	452.62	162.00	0.99	0.02		0.84	0.77	0.81	0.80	<b>0.15</b>

*Note.* N = 3,062. Factor loadings (l) reflect the relationship between individual raters and a latent trait factor for each trait.  $\gamma_{\text{perf}}$  reflects the univariate relationship between latent trait factor and the latent performance factor.

Finally, Table 10 displays how **LMAP** scales predict specific effectiveness items. Not surprisingly, the Teamwork traits (particularly Helpfulness and Sociability) tend to be the scales most predictive of “Getting along with others,” and the Domineering Traits (Rigidity, Hostility, and Need for Control) have negative relationships with effectiveness in getting along. Similarly, the Task Mastery traits (particularly Innovation, Conscientiousness, and Achievement Drive) are the best predictors of target leaders’ performance compared to others and their ability to produce results. In contrast, the Dependence, Tension, Rigidity, and Hostility traits impair target leaders effectiveness at these more task-focused aspects of performance. Leadership and Overall Effectiveness are tied to both Teamwork and Task Mastery Traits. Finally, Approval Seeking appears to help individuals get along with others, though it ultimately impairs effectiveness in accomplishing tasks and in leading others. On the whole, examining these specific effectiveness items provides a more fine-grained perspective on particular behaviors resulting from **LMAP** traits.

**Table 10: SEM Univariate Regression Estimates ( $\gamma_{xyi}$ ) for Predicting Specific Performance Items from LMAP Latent Trait Factors (Controlling for a Common Method Factor with Raters)**

LMAP Scale	Q142: Perf. Compared	Q143: Getting Along	Q144: Produce Results	Q145: Leadership Ability	Q146: Overall Effectiveness
Helpfulness	.40	.96	.29	.62	.50
Sociability	.36	.72	.28	.56	.42
Approval Seeking	-.18	.33	-.24	-.14	-.14
Dependence	-.32	-.03	-.34	-.34	-.29
Tension	-.33	-.42	-.29	-.43	-.36
Rigidity	-.33	-.71	-.26	-.47	-.39
Hostility	-.21	-.74	-.15	-.34	-.29
Need for Control	-.20	-.84	-.11	-.36	-.29
Competitiveness	-.08	-.51	-.04	-.16	-.15
Conscientiousness	.49	.21	.57	.42	.51
Achievement Drive	.45	.20	.47	.45	.44
Innovation	.63	.32	.59	.64	.59
Openness to Feedback	.12	.20	.12	.15	.14

*Note.* Separate SEM models fit for each LMAP scale. For all models, CFIs equaled or exceeded .95 and RMSEAs were below .04.

**Relationship Between Competencies and LMAP Traits**

In 2009-2010 ninety managers at a North American financial services firm completed a two-part multi-rater assessment that included the **LMAP 360** assessment and a set of 360-degree measures of the firm’s leadership competencies. The firm's leadership model had been used with senior managers for the previous eight years and measured job competencies that the firm believed was associated with effectiveness at the firm. While the competencies were “customized” and adapted for this firm, the model was similar to management and leadership competencies many other organizations identify as keys to effectiveness (i.e., Managerial Courage, Makes an Impact, Displays Excellent Judgment, Effective on Teams, Motivates and Develops Others, Inspires the Will to Win).

These 90 cases were analyzed to examine the relationship between the two instruments and found a pattern of strong correlations between the **LMAP** traits and the leadership competencies. Analyses showed that high scores on competencies were correlated with traits associated with high performance in LMAP (Openness to Feedback, Helpfulness, Sociability, Conscientiousness, Achievement Drive) and Innovation) and low scores on competencies were correlated with the counterproductive traits in LMAP (Approval Seeking, Dependence, Tension Rigidity, Hostility, Need for Control, and Competitiveness) associated with lowered performance.

**Table 11: Relationship Between Competencies and LMAP Profiles and Traits**

	Makes an Impact	Displays Excellent Judgement	Managerial Courage	Effective Teams	Motivates & Develops	Inspires the Will to Win
Top Heavy Profiles	0.67	0.60	0.53	0.63	0.60	0.69
Bottom Heavy Profiles	-0.20	-0.46	-0.63	-0.61	-0.60	-0.36
Teamwork Traits	0.20	0.48	0.62	0.68	0.74	0.55
Task Mastery Traits	0.69	0.41	0.23	0.31	0.23	0.47
Deference Traits	-0.34	-0.37	-0.44	-0.33	-0.24	-0.42
Domineering Traits	-0.10	-0.39	-0.59	-0.55	-0.55	-0.25

## **Discussion: The LMAP and Related Research on Job Effectiveness**

Corporate folklore says that when you make your top salesperson the sales manager, you lose your best salesperson and get a lousy manager. This bromide implies huge differences between personality characteristics that drive success in sales versus success in management. In fact, high performers are far more alike in more ways than they differ. They share a preference for demanding work that provides challenges; they are intellectually flexible and optimistic, and they are supportive and encouraging. On balance, the personality traits that help make managers successful are the same traits that help make salespeople, professionals — and even commercial airline pilots effective.

Many other studies are consistent with the results of the **LMAP** study in 2001 that is explained in the Validity section above. In a 1991 study, published by Gratzinger, Warren, and Cooke in Measures of Leadership (Clark and Clark editors), researchers used a 360-degree circumplex personality assessment (called Acumen WorkStyles) and found that with a sample of 556 managers, those who were ranked in the top 10 percent of effectiveness by co-workers had personality profiles dominated by high scores on measures of achievement, creativity, self-confidence, helpfulness and sociability. In contrast, managers who ranked in the lowest 10 percent of effectiveness had personality profiles dominated by counterproductive traits including dependence, apprehension, rigidity, and high needs for control. A similar study by Guest and Warren (in an unpublished monograph, Acumen International), with over 2,000 individual contributors rated by over 10,000 raters, found the same pattern whereby the most effective had a personality profile dominated by “success traits” and the least effective had profiles dominated by counterproductive traits.

Research by Cooke, Lafferty and Rousseau using the LifeStyles Inventory (a circumplex assessment published by Human Synergetics) that measures personality traits similar to those measured by **LMAP** show strong relationships between personality and symptoms of stress. Their studies found that people with a personality profile dominated by counterproductive traits (Need for Approval, Dependent, Tense, Rigid, Controlling, Competitive), experience more medical stress symptoms than people with a personality profile dominated by the success traits.

These studies are consistent with the findings reported in a 1993 *Harvard Business Review* article that describes a study of the personality styles and behaviors that make Bell Labs engineers successful. The study found that the most productive and valued engineers at Bell Labs were not those with the highest IQ or achievement test scores but those who excelled in teamwork, cooperation, and rapport. The engineers who formed alliances with other workers and used positive persuasion (versus authority or rank) and consensus building were the most successful. This study demonstrates how personality operates like a lens through which knowledge and skills are either sharpened or blurred.

The Big Five Model of Personality is widely used in organizational psychology work for employee selection and development. The Big Five measures five personality dimensions: conscientiousness, agreeableness, emotional stability, extraversion, and openness to new experiences. Research utilizing the Big Five finds that across professions, conscientiousness is the most consistent predictor of effectiveness. The conscientiousness dimension measures self-confidence, a sense of competence, organization, order, discipline, and the enjoyment of challenging work — essentially the same characteristics measured on the Conscientious and



Achieving scales of the **LMAP**. Big Five studies also show that the attitudes and behaviors measured by the **LMAP** Helpfulness and Sociability scales are linked with higher job performance.

Counterproductive personality traits in others are a huge source of stress in the workplace. Harvey Hornstein, Ph.D., of Columbia University, surveyed 1000 people and found that 90 percent, at some point in their career, claimed that they had worked for a “brutal boss,” who publicly humiliated them or blamed them for his own failures. Hornstein estimates that at least 20 percent of employees report to a manager who is a brutal boss. His research is consistent with findings by David Campbell, a Senior Fellow at the Center for Creative Leadership, who says, “We’ve had managers come to our center who actually defined leadership as the ability to inflict pain.”

Robert Hogan, Ph.D., Chairman of the University of Oklahoma Organizational Psychology Department, notes counterproductive personality traits as the leading cause of employee stress and discontent. He cites studies showing that “since the 1950’s – 70 percent of employees surveyed have said that the worst, most stressful part of their job is their immediate boss.”

In a 1997 study of 511 company leaders, Richard Hagberg found that 70 percent were “loners,” dangerously insulated from other team members. These leaders were intellectually and technically skilled, but also self-absorbed, impatient, impulsive, manipulative, dominating, and critical of others. They lacked insight into their strengths and weaknesses and were abusive to others in the workplace. Hagberg recounts the story of a CEO impatiently waiting in line with his wife to renew his driver’s license. He becomes infuriated at how long it is taking to get served and says to his wife, “I have a lot to do. Don’t they know who I am?” She replies, “Yeah, you’re a plumber’s son who got lucky.” His wife’s comment gave him an abrupt insight into his outsized sense of self-importance — a self-importance and sense of entitlement that caused him — and others — difficulties in and out of work.

The Center for Creative Leadership (CCL) is a well-respected, nonprofit institute based in North Carolina that is dedicated to the study of management and executive leadership. Researchers at CCL coined the term “derailment” to describe how high-potential, fast-track managers are skipped over for promotions or are terminated because of personality flaws. CCL lists twenty-six derailment traits, including difficulty handling pressure, interpersonal insensitivity, a lack of team skills, arrogance, and relying too much on natural talents.

### **Studies from Commercial Aviation**

The results of studies of personality traits of military and commercial airline pilots are stunningly consistent and have found that:

1. Crews led by captains with strong social skills and a high need for achievement make the fewest errors.
2. Crews led by captains with below-average achievement motivation and a negative expressive style (rigid and controlling) make more errors.

Studies at the Air Force Academy obtained similar results. Flight crews led by captains who were controlling, focused only on tasks, and demeaned rather than encouraged others had the most errors. Captains who made the fewest errors showed the following behaviors:

- made use of all the available resources and delegated task responsibilities clearly
- communicated well with other crew members and established a cooperative tone
- established authority through competence rather than through rank
- encouraged others to be involved and provide input
- “walked the talk”

### **Using the 360-degree, Multi-Rater Method**

Why use the multi-rater method? David Meyers conducted a study in which professionals self-rated their social and leadership skills. One hundred percent of the respondents self-rated their social skills in the top half. One in four respondents placed themselves in the top 1 percent in social skills. Only one in fifty said they were in the bottom 25 percent in leadership capability. Obviously the self-assessment method has shortcomings which cannot be overcome in using personality measures for employee selection purposes, but are easily overcome in their use for employee development but using a multi-rater method. Studies like David Myers – which are consistent with the **LMAP** validation studies that show the shortcomings of the self-assessment method – are one key reason that **LMAP** is a 360-degree multi-rater assessment.

Perhaps even more importantly, team-members interact with a leader based on their perceptions of that leader – not based on that leader’s self-perceptions. Leaders need reliable, valid, relevant feedback on how they are being perceived by team members in order to better self-manage their execution of leadership roles and responsibilities. Consistent with this, the bulk of the **LMAP** Report focuses on feedback by raters.

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