



# Mediating Influence of Self Leadership on the Relationship between Adult Attention Deficit and the Operational Effectiveness of Project Managers



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## Abstract

**Purpose:** Examine the relationship between adult attention deficit (AAD) and the operational effectiveness of project managers (OEPM) as mediated by self-leadership (SL).

**Design/methodology/approach:** 80 actively employed business graduate students had the opportunity to be a project manager within a project team. Each team member rated the others on their OEPM, completed a self-report measure of SL, and identified a close associate who completed an observer version of the Brown Attention Deficit Scale. The Sobel and Hayes tests were used to test the hypothesis that SL mediates the relationship between AAD and OEPM.

**Findings:** AAD is negatively associated with SL and OEPM, and SL is positively associated with OEPM. SL partially mediates the relationship between AAD and OEPM.

**Research limitations/implications:** Future research requires use of samples drawn directly from the workplace, and an examination of other potential mediators like emotional intelligence.

**Practical implications:** Organizations and project managers wanting to ensure efficient and effective operational management of projects, especially under more autonomous conditions, need to be aware of the constraining influence of AAD on SL and OEPM. Relatively more intensive training and coaching that addresses the key symptoms of AAD and strengthens both self-leadership and operational competencies is suggested for disordered project managers. The use of peer matching, support and coaching within project teams represents a potential opportunity for distributing the potential benefits of the disorder while managing the challenges. Employee assistance programs that raise awareness and provide access to assessment are an important part of multimodal management of the disorder in the workplace.

**Social Implications:** Employers are facing increasing social, legal and economic pressures to support and make appropriate use of functional but disordered employees, be more inclusive, and translate employee diversity into increased social and economic value. This research provides constructive suggestions on how to support the higher order cognitive processes, self-situation interactions and behavioral modification strategies needed by disordered project managers.

**Originality/value:** This is the first empirical examination of the relationships between AAD, SL and OEPM and is of value to researchers, organizational development specialists, human resource management specialists, managers and employees who are seeking improved project performance and multimodal management of attention disordered project managers.

**Keywords:** Attention deficit disorder; Attention deficit hyperactivity disorder; Adult attention deficit hyperactivity disorder; Project management; Project performance; Self-leadership

**Abbreviations:** AAD: Adult Attention Deficit; OEPM: Operational Effectiveness of Project Managers; SL: Self-Leadership

## Introduction

The use of projects is prevalent in many economic sectors including the rapidly expanding creative industries (e.g., video gaming, media, fashion, multimedia software, entertainment

etc.) [1,2]. This highlights the general importance of projects and the strategic value of creative projects [3,4]. Growing interest in improving the management of projects has intensified research

on both the proximal and distal determinants of project creativity and performance [5,6]. A key proximal influence is the project manager [6-9] including their creative abilities [10-12], which can enhance the creativity of other employees [13], the overall team [14,15], and both the creative and overall performance of projects [16].

Research on creativity in the workplace conducted by White & Shah [17,18] found that attention related disorders are associated with higher creative performance across a wide range of jobs and industries. Attention related disorders are the most prevalent diagnosed neurobehavioral disorders [19], and they tend to persist through adolescence and into adulthood [20]. Prevalence research suggests that at least 5% of the global workforce have clinical levels of the disorder [19] with many more adults influenced by the symptoms [21]. Disordered project managers who are in part appointed because of their creative abilities may also experience the disruption of higher order cognitive processes that support the traditional operational management aspects of project management (OEPM). Recent research supports a negative association between adult attention deficit (AAD) and the operational effectiveness of project managers [22,23]. Further research on the key mediators and moderators of the relationship between AAD and OEPM is required in order to identify manageable points of intervention that will assist in reducing the negative operational effects of the disorder. This research study examines the mediating influence of self-leadership (SL) on the relationship between AAD and OEPM.

### Adult Attention Deficit

#### Definition

Research conducted by Brown [24,25] on symptoms that commonly occur among adults with attention deficits produced the following 5 symptom clusters (factors):

- difficulty getting started on tasks and maintaining an organized task management process (associated with a relatively higher arousal threshold and/or constraining anxiety)
- difficulty attending to required information and maintaining concentration (challenges with focusing on priority tasks that are not of high personal interest, receiving and organizing information, and both avoiding and resisting distraction)
- difficulty arousing and maintaining sufficient energy and effort (insufficient and/or inconsistent levels of energy)
- difficulty managing emotional disruption (challenges with intense, negative and disruptive moods, irritability and emotional reactivity, combined with difficulty managing emotions that constrain the development of constructive relationships)
- difficulty making use of working memory and accessing/recalling learned material (episodic or consistent

chronic forgetfulness; challenges with organizing, sequencing, and retaining information in short term memory; and problems accessing and making use of learned content).

This collection of symptom clusters is referred to as adult attention deficit (AAD) [26]. Use of strictly categorical measurement of adult attention deficit based on the presence (or lack thereof) of a particular number, type and level of symptoms, has been criticized by both researchers and practitioners as overly simplistic [21,27-30]. Categorical measurement ignores evidence that the impairment and associated symptoms fall along a continuum [21,31]. Categorical measurement excludes non-clinically disordered adults, especially those who fall close to the cut-off, from appropriate consideration within research on nomological networks of interest [29-31]. Organizational behavior researchers have addressed the limitations of treating subjects close to the cut-off threshold as essentially the same as those with no symptoms by using dimensional measurement and correlation analysis within individual and team performance networks [32,33].

Brown [21,24] uses dimensional (severity) measurement of the symptom clusters to measure the overall level of AAD. Brown [21,24] defines AAD as a persistent pattern of inattention and related cognitive, emotional and effort related symptoms that occur with varying levels of severity and creates progressively greater challenges within the personal, academic and work life of adults as severity increases. Research by Coetzer [23,32-34] demonstrates that dimensional measurement and correlation of AAD with a variety of organizational behavior variables reveals important components of the individual and team performance nomological network.

#### Occupational and Organizational Impact

Attention related disorders cost the global economy approximately 144 million days of lost production per annum [35] and are associated with annual income loss in the United States equivalent to losses arising from drug and alcohol abuse [36]. Organizational behavior research suggests that attention related disorders are associated with both performance challenges and benefits. The disorder has been associated with reduced job performance, productivity, and attendance [32-34, 37-40], while also associated with positive organizational behaviors like the ability to work in a dynamic environment, ingenuity, innovation, creativity, perseverance, risk taking and intense focus on things of interest [18, 41-44]. The positive associations help explain why entrepreneurs appear to have significantly higher prevalence rates [42-44]. Recent multi-industry research by White & Shah [18] confirms that attention disorders are associated with higher overall levels of creative achievement in the workplace.

The ability of an organization to promote innovation, creativity and intrapreneurship among employees, teams and projects is an important success factor within an increasingly competitive

global economy [3,16,46,47]. The person-situation interaction approach suggests that various personal and contextual factors interact to exert influence on individual and team level creativity [48,49]. Recent research suggests that employees with low creativity are more creative when working closely with highly creative employees [13,50], and that supervisor support for creativity promotes employee and team creativity [14,15,51]. This helps to explain why imagination and creativity are important project manager competencies that are increasingly emphasized when selecting project managers [10-12]. The general workforce prevalence of AAD [19] combined with the significant presence of the disorder within the domain of creative capacity and performance [18], suggests that organizations need to understand and respond to the accompanying challenges of the disorder in order to protect the benefits of deploying potentially disordered project managers.

Recent research has identified both the negative effect of excessive creativity on project performance [52,53] and a negative association between AAD and the operational effectiveness of project managers (OEPM) [22,23]. Research suggests that multimodal management of the disorder by combining both internal and external interventions help to maximize performance of disordered employees without the loss of key benefits like creativity [54,55]. In order to manage the potential constraints of the disorder on the operational (traditional organization and control) aspects of project management, a better understanding and management of the relationship between AAD and OEPM is required.

### Project Management

#### Definition and Impact

Project management involves the use of knowledge, skills and techniques that support efficient and effective execution of a temporary endeavor undertaken to create a unique product, service, or result [56]. Project management research has revealed that the personality, management/leadership style, and competencies of the project manager is an important contributor to project performance [7-10,57,58]. Research on project management competencies has produced various groupings of key competencies including traditional/operational management (planning, organizing, executing, and controlling a sequence of project activities to ensure completion of the project scope on time and within budget) [12,59,60], and promotion of needed types and levels of creativity and innovation [10-12,16]. Although the required profile of project management competencies is influenced by the particular project conditions, traditional/operational management competencies are necessary across all project contexts and may be sufficient under closed project conditions (performance context is clear, stable, simple, low tech and does not require high levels of novelty). Traditional operational management competencies rely on higher order

cognitive processes (e.g. planning, modelling, predicting, sequencing etc.) that are typically disrupted by AAD [23,26,37].

### Self-Leadership

#### Definition and Impact

Organizational control of behavior is the result of an interaction between external controls and personal behavioral control processes. The movement toward delayed structures, increased delegation, fluid roles, autonomous teams and project work has increased the relative importance of self-regulating and self-motivating systems, generally referred to as self-leadership [62,63]. Houghton, Dawley & DiLiello [64] state that "self-leadership is a process of behavioral and cognitive self-evaluation and self-influence whereby people achieve the self-direction and self-motivation needed to shape their behaviors in positive ways in order to enhance their overall performance" (pg. 217). The process requires the personal ability to use cognitive, motivational and behavioral self-managing strategies to enhance performance [62,65-68].

Cognitive self-leadership strategies manage the extent to which personal thought patterns support the behavior required for optimal performance. These strategies prevent or reshape performance inhibiting thoughts and promote more positive and optimistic thought patterns that support performance. Key strategies include shaping personal beliefs and values, self-talk and self-imagery [62,69]. Dysfunctional beliefs and values that produce habitual performance constraining thoughts need to be identified and reshaped in order to protect and enhance performance [70]. Self-talk is what we covertly tell ourselves [62]. Negative self-talk produces negative emotions and performance inhibiting states like reduced efficacy, anxiety and depression. Increased awareness and orientation of internal dialogue toward more positive and constructive content will help to promote performance. Greater personal awareness and management of self-talk should also improve emotional control and problem solving under challenging situations. Self-imagery involves cognitively simulating how tasks will be performed in order to create a positive mental image for guiding performance [62].

Motivational self-leadership strategies involve managing the motivating potential of work by seeking and promoting positive feelings derived from the work situation. Finding ways to enhance the natural rewards of the work situation helps to energize and sustain behavior that supports performance. This is achieved by transforming negative job-related cues into more positive ones and/or suppressing negative cues through cognitive avoidance or selective focus on positive aspects [69]. This is also achieved by shaping the work and work environment in a way that maximizes the meaning and enjoyment derived from work [71].

Behavioral self-leadership strategies include the use of self-observation, personal goal setting, self-rewards, self-correcting

feedback and self-cueing to enhance performance [62,63]. Self-observation and adjustment involve examining personal behavior in relation to a standard and making the necessary behavioral adjustments to align personal behavior with that standard [72]. This includes inhibiting or eliminating sub-optimal behavior and identifying and promoting optimal behavioral patterns.

Personal goal setting involves establishing and pursuing both personal and organizational goals in a constructive manner [73]. Self-reward strategies involve establishing a contingency reward system that evokes and sustains motivation to perform important tasks by distributing personally valued rewards after completing important milestones or the entire task. Self-correcting feedback involves constructive self-examination of sub-optimal behavior and performance for the purpose of reshaping behavior to improve performance. Self-cues like various types of reminders and inspiration objects help to keep attention focused on the performance of important tasks [63]. Behavior focused strategies often help support the performance of necessary but potentially uninteresting or unpleasant tasks that are essential for long term success [64].

Recent research suggests that self-awareness and volitional strategies are an important part of self-leadership [74,75]. Houghton et al. [64] state that "self-awareness strategies involve specific efforts to focus attention on oneself for the purpose of selectively processing self-related information resulting in knowledge about oneself" (pg. 219). These strategies provide the opportunity for self-observation. Volitional strategies involve the process of forming the intent to develop goals which help with the process of setting goals in relation to difficult or unpleasant tasks [74].

Research on self-leadership in organizations suggests a positive association with efficacy and performance at both the individual and team level [65,76-81]. Research on the determinants of self-leadership suggest that individual psychological characteristics significantly influence the capacity for self-leadership [82,83].

## The Relationship between AAD, SL and OEPM

### Hypotheses

The general proposition guiding this research is that self-leadership (SL) mediates the relationship between AAD and OEPM. AAD is proposed to have a negative relationship with both SL and OEPM, and SL is proposed to have a positive relationship with OEPM.

Adult workers who experience difficulties with getting organized and started on tasks, concentration, sustaining effort, managing emotional interference and using short-term working memory will be less effective at leading themselves in the workplace. All the components of self-leadership (cognitive, motivational and behavioral) require sustained attention, reflection upon and shaping of the following inner experiences and self-situation interactions:

- perception of self and performance situation (beliefs, values, suppressing negative cues etc.)
- self-guides (personal goals, self-talk, self-imagery)
- performance situation (shape situation to enhance natural rewards)
- self-motivation (establishing a contingent reward system)
- performance behavior (self-correcting sub-optimal behavior)

The ability to identify and shape experiential, situational and behavioral elements of a performance situation require efficient and effective use of higher order cognitive processes. Difficulties sustaining both attention and effort, inhibiting initial impulses and holding/managing information in working memory will disrupt the sustained self-reflection, analysis, planning, problem-solving and decision-making processes required for self-leadership. Difficulties managing emotional interference will also make it more difficult to establish and maintain the level of self-reflection, perceptual shaping and behavior modification required for effective self-leadership. Emotional interference will also constrain the ability to engage in successful self-situation interactions and shape complex social processes in order to enhance natural and contingent rewards which support the self-motivation component of self-leadership. Difficulties inhibiting impulsivity (delaying gratification) will further constrain the process of establishing contingent rewards tied to milestones and decrease the likelihood of completing unpleasant or uninteresting tasks without external pressure.

### H1: Adult attention deficit is negatively associated with self-leadership

Project managers who experience difficulties with getting organized and started on tasks, concentration, sustaining effort, managing emotional interference and using short-term working memory will be less efficient and effective at managing the traditional operational components of a project. They will be less able to activate and organize the project initiation stage, establish clear and appropriate project goals, map out and schedule all the require tasks, organize and integrate the tasks into an efficient project plan, manage project participants and ensure both timely and successful execution of the project. Disorder adults are also indecisive when facing conflicting goals [84] and disproportionately attentive to project tasks of personal interest [85] which should further constrain operational efficiency and effectiveness.

### H2: Adult attention deficit is negatively associated with operational effectiveness of project managers

The operational effectiveness of project managers depends on their ability to constructively shape their perceptions, experiences and self-situation interactions with the project, project team

and performance situation. Project managers need to be aware of, reflect upon and shape project related perceptions, beliefs, values and inner dialogue, in ways that support the efficient and effective operation of a project. They also need to cognitively simulate how tasks will be integrated and performed in order to create an organized, informative and positive mental image for guiding integration and performance of project tasks. The ability to resist or restructure negative self-talk, difficult emotions and pessimistic beliefs is necessary when facing the inevitable operational challenges that arise. Project managers also need to find constructive ways of establishing and/or enhancing the contingent and natural rewards of a project situation and either suppress or transform negative cues in order to self-motivate. Setting personally relevant goals that are aligned with the project situation plus establishing a contingent self-reward system tied to project milestones helps to arouse and sustain motivation. Operational effectiveness also depends on the ability to generate and respond to self-correcting feedback plus integrate self-cues into the operational process that reminds and inspires project managers to keep attention focused on the performance of important operational tasks. This helps ensure the performance of necessary but potentially uninteresting or unpleasant tasks that are important for operational success.

### **H3: Self-leadership is positively associated with the operational effectiveness of project managers**

Difficulties with activation, organization, attention, effort/energy, emotional interference and use of working memory will constrain the self-directing and self-motivating actions required to effectively manage the operational aspect of a project.

### **H4: Self-leadership mediates the relationship between AAD and the operational effectiveness of project managers**

## **Methods**

### **Subjects and Procedures**

The subjects were eighty-four students attending a university in the United States. Subjects participated in a business course that required them to work in 4-person autonomous project teams. Each team was responsible for completing a major business project which required the completion of 4 sub-projects. Each team was required to complete a strategic planning process and produce a strategic plan based on the 4 traditional elements of strategic planning - external opportunities and threats plus internal strengths and weaknesses (SWOT). Each team member was required to manage one part of the SWOT analysis and the other team members were required to work for them on that particular sub-project. Each of the 4 sub-project managers (team members) were expected to meet on a regular basis to integrate their sub-projects into an overall project plan and manage the progress of the overall project. The general operational phases of project management, related competencies and tools were reviewed at the beginning of the course.

The project conditions were semi-closed because the project outcomes (scope and timeline) were specified with a reasonable level of clarity and detail from the outset, but the process of achieving the outcomes was delegated to the project managers. The project conditions represent low to moderate complexity, uncertainty, technology, novelty and pace. These conditions mostly emphasize the need for basic operational (traditional control) project management competencies.

At the end of the semester each of the team members completed an assessment of the OEPM of the other team members. Each subject was also asked to identify someone who knew them well and would be willing to complete an honest assessment of their behavior. The identified observers completed an observer version of the Brown Adult Attention Deficit Scale (BAADS) under conditions of anonymity. Each of the subjects completed a self-report measure of self-leadership (SL). Four of the subjects did not have a measure of AAD and these subjects were removed from the dataset.

Principle components factor analysis with a varimax rotation was used to confirm the dimensionality of the OEPM measure, and examine the contribution of the individual items to the factors. Pearson product moment correlations were used to test all the hypotheses regarding associations between the measures, and both the Sobel [86] test recommended by Baron and Kenney [87] and the Hayes test [88,89] were used to examine the mediating influence of self-leadership on the relationship between AAD and OEPM.

## **Measures**

### **Adult Attention Deficit (ADD)**

Adult attention deficit was measured using the Brown Attention Deficit Disorder Scale (BADDSS) [21,23]. The instrument was designed and validated for use with adults (18 years and older) and contains 40 items grouped into five clusters of related symptoms. The questions were phrased in third person singular to support ratings by observers. The instrument uses a four-point behavioral frequency scale (never, once a week, twice a week, almost daily). Cluster 1 measures difficulty in getting organized and started on tasks (e.g., “experiences excessive difficulty getting started on tasks” and “needs to be reminded by others to get started or to keep working on tasks that need to be done”). Cluster 2 measures problems in sustaining attention while performing tasks (e.g., “listens and tries to pay attention but soon becomes distracted” and “misses important information”). Cluster 3 measures problems in maintaining the required energy and effort while performing tasks (e.g., “runs out of steam and doesn’t follow through” and “cannot complete tasks within the allotted time”). Cluster 4 measures difficulty with moods, emotional reactivity and sensitivity to criticism (e.g., “is easily irritated” and “has a short fuse with sudden outbursts of anger”). Cluster 5 measures forgetfulness in daily routines and problems with recalling learned

material (e.g. “intends to do things but forgets” and “forgets to bring needed things”). The total score for a symptom cluster was generated by adding the scores on the questions within each symptom cluster. The total score for AAD was generated by adding up the scores on all of the questions. Each research subject was asked to identify someone who both knew them well and would be willing to provide an honest assessment of their behavior. The observers completed the assessment under conditions of anonymity.

**Self-Leadership (SL)**

Self-leadership was measured using the abbreviated self-leadership questionnaire (ASLQ) [64]. The instrument was designed and validated for use with adults and is a short form of the revised self-leadership questionnaire (RSLQ) [69]. The nine self-report items measure each of the primary dimensions of self-leadership – constructive thought strategies (3 items e.g., “sometimes I talk to myself (out loud or in my head) to work through difficult situations”), task motivation (3 items e.g. “I visualize myself successfully performing a task before I do it”), and behavioral strategies (3 items e.g. I make a point to keep track of how well I’m doing on important tasks”). Subjects used a five-point Likert scale (strongly disagree to strongly agree) to rate the

extent to which they agreed with each item. A total score for self-leadership was derived by adding up the scores on each of the questions.

**Operational Effectiveness of Project Managers (OPEM)**

Operational effectiveness of project managers was developed after reviewing the core project management competencies outlined by the international project management association [90], the project management institute in the United States [91] and recent research on the assessment of project managers [10,11,92-96]. Thirteen items that represent the key operational management responsibilities and tasks of project managers were selected (Table1). Example items are “mapped out all the key project tasks and milestones”, “sequenced and integrated the key project tasks into a project plan”, “identified and managed the critical path that determined the duration of the project” and “secured the input and support of project team members.” The instrument uses a seven-point Likert scale (1=strongly disagree, 2=disagree, 3=slightly disagree, 4=neutral, 5=slightly agree, 6=agree, 7=strongly agree). Each project manager was rated by the other three members of the project team and the scores on each question were averaged and then added to get a total score for the operational effectiveness of the project manager.

**Table 1:** Principle Components Factor Analysis of Operational Effectiveness of Project Managers with a Varimax Rotation.

|  | Component 1 |
|--|-------------|
| Established clear and appropriate goals for the project                              | 0.84        |
| Mapped out all the key project tasks and milestones                                  | 0.83        |
| Sequenced and integrated the key project tasks into a project plan                   | 0.83        |
| Kept project on track and ensured successful and timely completion of the project    | 0.79        |
| Identified and managed the critical path that determined the duration of the project | 0.77        |
| Secure the necessary resources to complete the key project tasks                     | 0.75        |
| Used resources efficiently   | 0.75        |
| Effectively allocated tasks and resources among project team members                 | 0.73        |
| Predicted and addressed high risk steps in the project plan                          | 0.71        |
| Secured the input and support of project team members                                | 0.7         |
| Monitored progress and addressed problems effectively                                | 0.69        |
| Project plan supported achievement of project goals in an efficient manner           | 0.67        |
| Promoted cohesion and effective working relationships among project team members     | 0.67        |

**Results**

**Descriptives, Factor Analysis, Correlations and Regression**

A principle components factor analysis with an orthogonal rotation (varimax) was conducted to examine the factor structure of the OPEM instrument. The factor analysis for the operational effectiveness items produced a single factor with factor loadings ranging from 0.67 to 0.84 suggesting that each item is making a meaningful contribution to the measure. The Cronbach alpha

internal reliability coefficient was  $\alpha = 0.84$  and could not be improved by eliminating items. This suggests that the instrument has good internal reliability with each item making a meaningful contribution.

The average intra-class correlations (two-way mixed effects model with absolute type agreement) among team member ratings of project manager effectiveness ranged from 0.72 to 0.88 suggesting acceptable inter-rater reliability. Means, standard deviations and correlations among the variables appear in Table 2. All variable distributions were approximately normal and

demonstrated reasonable variation across their respective scales. No univariate or bivariate outliers were considered problematic, and the product moment correlations revealed significant associations between the variables. The mean, standard deviation and maximum score for AAD (avg = 39.12, std dev = 17.94, max score = 102) are not significantly different from the instrument

validation samples and previous samples of subjects taken from the same university and a similar university in western Canada. Cronbach alpha internal reliability coefficients ranged from ( $\alpha = 0.84$ ) to ( $\alpha = 0.89$ ) suggesting good internal reliabilities. The linear regressions used for testing the mediation effect produced no problematic residuals.

**Table 2:** Means, Standard Deviations, Correlations and Internal Reliabilities.

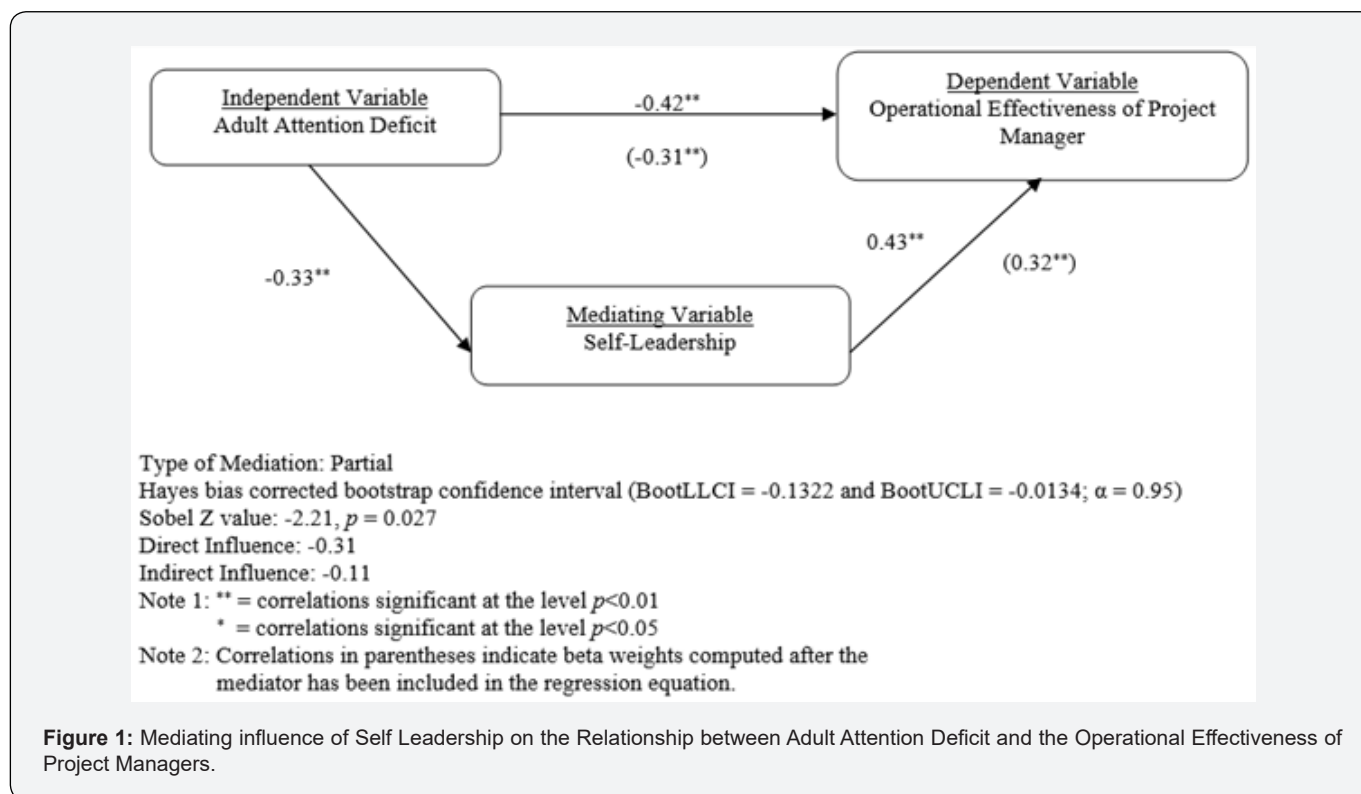
|   |  | Mean  | Std Dev | 1      | 2      | 3    |
|---|--|-------|---------|--------|--------|------|
| 1 | Operational Effectiveness of Project Manager | 62.03 | 11.94   | 0.84   |        |      |
| 2 | Self-Leadership                              | 32.87 | 4.76    | .43**  | 0.86   |      |
| 3 | Adult Attention Deficit                      | 39.12 | 18.67   | -.42** | -.33** | 0.89 |

Note 1: Note 1: Cronbach Alpha internal reliabilities are shown on the diagonal.  
 Note 2: \*\* Correlation is significant at the 0.01 level (2-tailed).

**Empirical Tests of Hypotheses**

The significance threshold for all the empirical tests was set at  $\alpha = 0.05$  (2 tailed). The correlation between AAD and SL (*Hypothesis 1*) is statistically significant ( $r = -0.33, p < 0.01$ ) providing support for the hypothesis that AAD is negatively associated with SL. The correlation between AAD and OEPM (*Hypothesis 2*) is statistically significant ( $r = -0.42, p < 0.01$ ) providing support for the hypothesis that AAD is negatively associated with OEPM. The correlation between SL and OEPM (*Hypothesis 3*) is statistically significant ( $r = 0.43, p < 0.01$ ) providing support for the hypothesis that SL is positively associated with OEPM.

The Sobel test for mediation is statistically significant ( $Z = -2.21, p = 0.027$ ) and the Hayes bias corrected bootstrap confidence interval (BootLLCI = -0.1322 and BootUCLI = -0.0134;  $\alpha = 0.95$ ) does not contain zero suggesting the presence of mediation. The mediation results suggest that a statistically significant amount of the reduced operational effectiveness associated with AAD is the result of poor SL (Figure 1). A significant partial correlation between AAD and OEPM ( $r = -0.22, p < 0.05$ ) remains after including the mediator (SL) in the regression. This suggests that SL does not fully explain the association between AAD and OEPM, and that other unmeasured factors are helping to transmit the effect.



**Figure 1:** Mediating influence of Self Leadership on the Relationship between Adult Attention Deficit and the Operational Effectiveness of Project Managers.

## Discussion

### General

The results support a constraining influence of AAD on OEPM, partially mediated by SL. The direction of this relationship cannot be confirmed from this research and both opposite and bi-directional effects are possible. Studies supporting the contribution of genetic factors to the manifestation of the disorder [61] provides general support for the hypothesized direction in this study. Recent research suggesting that certain contextual conditions may help manifest a genetic predisposition or strengthen existing symptoms [97] suggests that particular project conditions may contribute to AAD. The size of the indirect influence is statistically significant but moderate suggesting the presence of other unmeasured mediators that need to be identified in order to better understand the nature of the relationship between AAD and OEPM.

### Implications for organizations and education institutions

Organizations wishing to ensure the success of their projects need to be aware of the influence of AAD and SL on OEPM. The increasing need for creativity within projects to create differentiating advantages suggests that disordered project managers may possess important beneficial competencies. However, increasing delegation, complexity and change within the contemporary performance environment requires more efficient and effective operational management of projects. This places greater demands on the related higher order cognitive processes of project managers that are often disrupted by the disorder.

A comprehensive response to supporting disordered project managers should address the core symptoms of AAD and strengthen both the capacity for self-leadership and key operational competencies. More intensive training in the operational management of projects, management of attention and memory, self-awareness and self-regulation, and emotional intelligence may be useful. Recent research confirms that project management training can improve the reflective, learning, self-adjustment and operational competencies of aspiring project managers [98]. The provision of personal, task and project management tools and technology will help to support the activation and organization of operational tasks. The provision of a workspace relatively free of distractions will help reduce the disruptions caused by relatively higher distractibility. The increasing availability of effective coaches (life, organizational, task, peer, manager as coach etc.) [99] offers a potential substitute for close supervision that can assist disordered project managers with developing constructive perceptions, self-talk, self-imagery and self-situation interactions that support self-motivation. Coaches can also help disordered project managers to secure and integrate the feedback necessary to make constructive behavioral adjustments. Recent research on the impact of various types of life and organizational coaching suggests that the coaching process

can significantly improve the experience and performance of disordered adults [100,101].

The design and development of project teams represents an opportunity for distributing the creative benefits associated with the disorder while managing the deficits. Team members and peer coaches can help disordered project managers to activate, organize, stay on track and manage disruptive emotions. They can also support disordered project managers with inhibiting perceptions, beliefs, self-talk and self-situation interactions needed to be self-motivated. Pairing disordered but potentially creative project managers with less creative participants who have effective coaching and administrative skills, may be an effective way of distributing the benefits of the disorder while addressing the deficits. Employee assistance programs that provide both disordered and non-disordered employees with information about the disorder and opportunities for assessment is an important part of constructively translating employee diversity into social and economic value.

Education institutions need to promote a better understanding of the disorder and assist aspiring project managers to recognize and respond to the symptoms of the disorder in both themselves and others. Early diagnoses and treatment may help to prevent the exacerbating cycles of failure that often arise when a disorder remains unaddressed [102]. Educating future managers about the condition will help to prevent their potential contribution to the emergence and reinforcement of such cycles through a lack of knowledge and skill. Increasing social, economic and legal pressures to provide reasonable accommodation for functional but disordered employees, be inclusive, take appropriate advantage of employee diversity, and translate diversity into improved performance underscores the general social and economic value of this research.

### Limitations and Future Research

Future research requires samples of project managers drawn directly from the workplace. Partial mediation suggests that other mediators associated with AAD and OEPM, like emotional intelligence and role stress, need to be examined. The influence of creativity within the relationships between AAD, project managers and project performance require further investigation. This requires better measurement of the creative competencies of project managers and project creativity [3,103]. This research supports the general proposition that the AAD influences the contemporary nomological network that determines the effectiveness of project managers.

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