

Sustainable Procurement Behavior Among Contracting Officers

by Robert A. Boesen

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Abstract

In this study, I investigated the Department of Defense Contracting Officers' reported behaviors to implement environmental criteria into federal acquisition processes. I intended to enhance sustainability in Department of Defense acquisitions. The following research question guided this study: Is there a relationship between a Department of Defense Contracting Officer's reported affective commitments to change and their sustainable procurement behaviors? I gathered data from Department of Defense Contracting Officers affiliated with the National Contract Management Association. I utilized an online survey adapted from Grandia's (2016) study and applied multiple regression analysis to explore the relationship between their reported commitment to change. The study revealed a positive relationship between affective commitment to change and a construct of sustainable public-procurement behavior among Department of Defense Contracting Officers, alongside an inverse relationship between their education levels and sustainable procurement behavior. I recommend the Department of Defense increase the Contracting Officers' affective commitment to change by implementing more awareness initiatives, customized training programs, and incorporating sustainability criteria into performance evaluations.

Keywords: sustainability, green procurement

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Chapter 1. Introduction

In the fiscal year 2022, the United States (U.S.) Department of Defense (DoD) awarded \$478.3 billion in contracts for supplies and services, representing a staggering nearly 50% of all Federal contract spending. The DoD is the largest purchaser of goods and services of all U.S. Federal agencies (USA Spending Team, 2022). According to Grandia (2016), governments frequently use their market power to compel private entities to assist them in achieving their public objectives. Bergeson (2002) noted that, given its enormous purchasing capacity, the federal government utilized this immense power to achieve environmental goals and priorities (p. 75).

To reduce the adverse effects of production and consumption, the U.S. Congress enacted laws to achieve sustainability in procurement. The first such law was Public Law 94-163 (1975), the Energy Policy and Conservation Act (EPCA). EPCA mandates the President to develop mandatory energy conservation standards and efficiency to govern Federal procurement decisions and policies. The ECPA ushered in a plethora of Federal Laws, regulations, and policies (Appendix A).

Federal laws, regulations, and policies on sustainable procurement have led the DoD to implement a sustainable procurement policy that gives preference and addresses goals for acquiring sustainable goods and services (Department of Defense, 2018). Federal laws, regulations, and policies alone cannot achieve sustainability. Responsibility to award a federal contract is accomplished primarily by one profession in the U.S. Government, which is called Contracting Officer (KO). To achieve that goal, the DoD must award contracts that implement sustainability. The position of KO in the hierarchy of federal procurement bears the responsibility to implement those sustainability policies. While they carry out this duty, other DoD

officers detail the agency's product or service needs, and concentrate on sustainability. These descriptions then guide the KO's procurement actions. This process is aligned with the Federal Acquisition Regulation (FAR) 11.002(d)(1), which mandates the consideration of sustainable acquisition when agencies procure products and services.

A KO is a government acquisition professional, which the FAR defines as "... a person with the authority to enter into, administer, and terminate contracts and make related determinations and findings" (Federal Acquisition Regulation [FAR], 2022). Consequently, only a KO has legal authority to bind the government to a contract with a third party. A DoD KO is employed by one of the DoD components and, when entering into a contract, must adhere to all federal laws and acquisition regulations as well as all DoD policies and supplemental acquisition regulations that the KO's component has issued.

Problem

KOs are pivotal in sustainable acquisitions within the U.S. DoD. The U.S. federal government's capacity to harness sustainable markets for environmental goals, leveraging DoD's significant buying power, critically hinges on the KOs' willingness to address barriers to sustainable procurement laws, regulations, and policies. The KOs are responsible for integrating these sustainable requirements into federal contracts, a construct referred to as sustainable public procurement behavior (SPB) (Grandia, 2016, p. 184).

Grandia (2016) noted that most studies conducted on sustainable public procurement (SPP) emphasize on the content of or barriers to SPP that identify organizational variables that either drive or impede SPP (p. 183). Grandia (2016) stated the presence or absence of such variables was found to hinder or cause SPP (p. 183). Grandia (2016) argued that identifying barriers or drivers does not fully explain the implementation of sustainable public procurement.

Utilizing studies from other business fields, she hypothesized that SPB would mediate between two drivers and the degree of compulsory or voluntary public procurement toward sustainability (p. 185). Although Grandia's study was not conducted in the United States, I intend to use her theory to analyze data in my study of SPB among KOs in the US DoD.

Purpose & Research Question

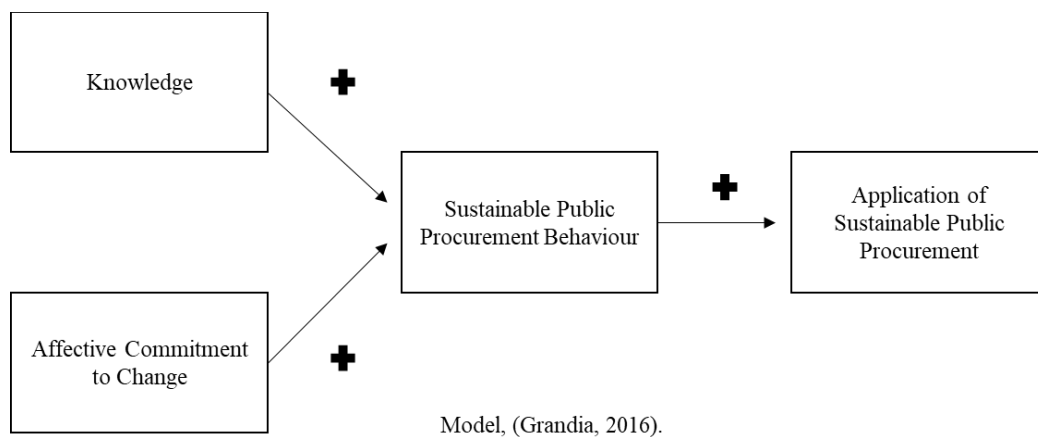
The purpose of this project is to advocate for improved sustainable procurement in the DoD by examining KOs' sustainable procurement behavior as measured on a validated instrument. In this study, I posed the following research question: Is there a relation between a DoD KO's affective commitment to change and sustainable public procurement behavior? I tested the following hypothesis:

- H₁ A KO's reported commitment to change will be positively related to reported sustainable public procurement behavior.

Model

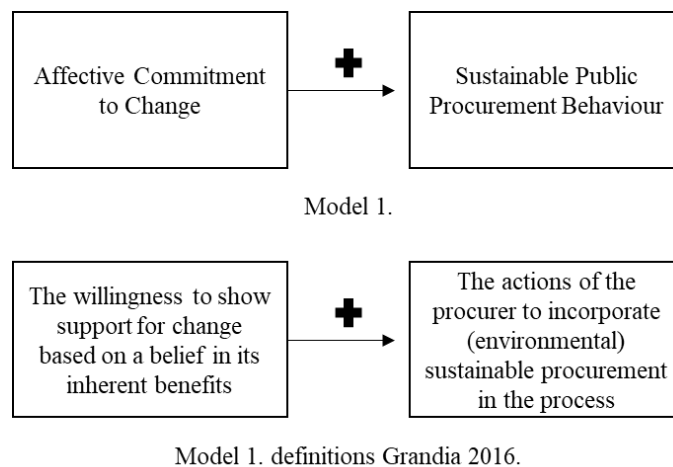
In this project, I analyzed data in accordance with Azjen's (1991) theory of planned behavior (TPB), which theory posits that actual behavior relates individuals' intentions to their real and perceived behaviors. Grandia (2016) tested whether sustainable public procurement behavior mediated relationships between affective commitment to change and knowledge in applying sustainability in public procurement projects (Figure 1). Her study controlled for the age, education level, and gender of procurement professionals in the Dutch Ministry of Defense (pp. 184-188).

Figure 1. Original Constructs



My replication of her study employed one of her constructs to test whether there is a relationship between affective commitment to change and sustainable public procurement behavior by a similarly controlled sample of KOs in the U.S. DoD.

Figure 2. Adapted Constructs



This study adapts Grandia's construct to assess how affective commitment to change relates to SPB in U.S. DoD KOs.

Significance

This research was the first empirical study to examine the SPB of KOs concerning sustainable acquisitions by the U.S. DoD. In this study, I contributed to the field of public procurement

by analyzing the sustainable procurement behavior of KOs to potentially increase the ecological benefits of purchasing sustainable goods and services nationally.

Summary

In this study, I sought empirical evidence to the U.S. DoD that may justify actions to increase sustainable public procurement behavior by KOs. Such increases would leverage the DoD's purchasing power to reduce adverse ecological effects of production and consumption. I applied the theory of planned behavior to analyze data from a validated survey. I tested the hypothesis that reported attitudes are associated with behaviors.

Chapter 2. Literature Review

In this literature review, I reviewed studies pertaining to behavior. First, I defined sustainable procurement by the U.S. DoD and reviewed studies on barriers and challenges to sustainable public procurement.

Sustainable Procurement

DoDI 4105.72 (2018) defined sustainable procurement as follows:

Procurement using sustainable environmental practices, including but not limited to, acquisition of EPA-designated recycled content products, environmentally sustainable electronics products, environmentally preferable goods and services, ENERGY STAR® and FEMP-designated energy-efficient products, water-efficient products, U.S. Department of Agriculture-designated biobased products, alternative fuels and alternative fuel vehicles, non-ozone depleting substances, low or non-toxic substances or products containing low or non-toxic constituents, renewable energy sources, and sustainable building materials (p. 20).

In accordance with this definition, I refer to sustainable public procurement behavior (SPB) as actions taken by public-sector organizations and individuals to incorporate environmental criteria into procurement processes.

Barriers and Challenges

Among studies that have identified barriers and challenges that hinder adopting and practicing sustainable procurement in the public sector, Vluggen et al. (2019) highlighted the importance of external pressures and accountability in sustainable public procurement (pp. 2-16). However, Preuss and Walker (2011) approached the issues from a cognitive perspective that identified such psychological impediments as cognitive dissonance and groupthink, which

impediments emphasized short-term advantages (pp. 495-516). Shadrina et al. (2022) said that challenges were due to rigid regulations on green public procurement (pp. 13-14). Other studies (e.g., Gelderman et al., 2015, pp. 78-79; Hasselbalch et al., 2014, pp. 306-308) emphasized such internal barriers as organizational culture and resources. In the following three subsections, I classify both internal and external barriers as forms of knowledge, complexity, and resources.

Knowledge

Four studies found that procurement professionals exhibited insufficient knowledge of sustainable procurement practices (i.e., Hasselbalch et al., 2014; Preuss & Walker, 2011; Testa et al., 2016). Preuss and Walker (2011) attributed the lack of knowledge primarily to insufficient training. Hasselbalch et al. (2014) attributed the issue to a lack of technical skills (p. 303). Testa et al. (2016) attributed it to a lack of comprehension that impeded the successful implementation of sustainable procurement (p. 8).

Complexity

Shadrina et al. (2022) discovered that procurement professionals viewed the regulations, information, and processes related to sustainable procurement as too stringent and overwhelming. They argued that stricter laws adversely affected environmentally friendly procurement compared to more flexible statutes (p. 12). Similarly, Vluggen et al. (2019) emphasized the need for comprehensive and updated rules, particularly in high-threshold regulations and lower-threshold tenders (p. 11). Preuss and Walker (2011) noted that procurement professionals experienced an overabundance of information and confusion surrounding the rules of sustainable procurement (p. 510). Shadrina et al. (2022) further found that the stringency of these

regulations made procurement professionals risk-averse, reducing their willingness to incorporate environmental variables into their acquisitions (p. 12).

Resources

Three studies reported limitations due to resource scarcity in sustainable procurement initiatives, such scarcity making it challenging to include environmental considerations regardless of procurement professionals' behaviors (Gelderman et al., 2015, p. 80; Hasselbalch et al., 2014, pp. 302-303, 307; Vluggen et al., 2019, p. 12). Both Gelderman et al. (2015) and Hasselbalch et al. (2014) indicated that sustainable goods and services were often unavailable in the market (pp. 80, 307). These studies also noted that high workloads and insufficient staffing hindered sustainable procurement efforts (pp. 80, 307). Similarly, Vluggen et al. (2019) pointed out that inadequate financial resources made it challenging for procurement professionals to engage in sustainable purchasing (p. 12).

Summary

In this chapter, I defined sustainable public procurement behavior (SPB) and reviewed studies of challenges and barriers to such behavior, including KOs' knowledge, along with the complexity of and resources for procurement.

Chapter 3. Method

In this study, I examined sustainable public procurement behaviors (SPBs) as reported in a survey of U.S. Department of Defense (DoD) Contracting Officers (KOs). I posed the following research question: Do Federal KOs' reported commitments to change relate to their sustainable public procurement behaviors? I tested the following hypothesis:

- H₁ A KO's reported commitment to change will be positively related to reported sustainable public procurement behavior.

I replicated Grandia's (2016) study that found a relationship between an independent variable of affective commitment to change and a dependent variable of sustainable public procurement behavior while controlling for age, education, and gender. In the following sections, I presented the participants, setting, instrument, procedures, planned analyses, and quality assurances.

Participants & Setting

This study's target population comprises National Contract Management Association (NCMA) members who consist of KOs, including DoD KOs. I am a member of NCMA, a professional organization with approximately 20,000 active members.

Procedures

I obtained institutional authorization from NCMA administrators (Appendix B). Upon approval from the University of Wisconsin-Stevens Point Institutional Review Board, I solicited potential participants via the NCMA official communication channels, including their email list of DoD KOs, newsletters, websites, and social media platforms. I furnished details of my study's aim and research questions and solicited voluntary participation. After obtaining informed consent (Appendix B), I sent a link to an online survey (Appendix C). All forms and data are stored on password-protected servers for seven years after publication.

Instrument

I used a validated survey adapted from Grandia's study to emphasize relationships among affective commitments to change and sustainable public procurement behaviors. I used an English translation modified to reflect US Federal policies and regulations.

Variables

I used Federal KOs' sustainable public procurement behaviors as a dependent variable. This variable indicates the extent to which individuals engage in sustainable purchasing strategies. Each item on the subscale measuring this concept is rated on a Likert-type scale from *Strongly Disagree* (= 1) to *Strongly Agree* (= 5). For example, one item is: "I actively seek environmentally friendly products when making procurement decisions."

I used KOs' reported affective commitments to change as an independent variable. This variable shows the emotional attachment and involvement of the participants in implementing sustainable procurement procedures. Each item on the subscale measuring this concept is rated on a Likert-type scale from *Strongly Disagree* (= 1) to *Strongly Agree* (= 5). For example, one item is as follows: "I have a strong personal connection to the concept of sustainable procurement."

The instrument further includes demographic items requesting covariate data on age, level of education, and gender.

Data Analysis

I employed multiple regression analysis to seek relationships among the independent variable of affective commitment to change and the dependent variable of sustainable public procurement behavior while controlling for potential confounding variables of age, education level, and gender. Multiple regression is a well-established statistical technique that reveals the

strength and direction of connections between variables, making it suited for testing the hypothesis (Montgomery, Peck, & Vining, 2012).

In this analysis, I included coefficients that show one-unit changes in the independent variable or covariate on the dependent variable, sustainable public procurement behavior, keeping all other variables constant. I used Microsoft Excel software.

Validity & Reliability

To ensure concept validity, I used a generally accepted theory of planned behaviors and peer-reviewed lists of barriers and challenges. To provide external validity, I sought to obtain a representative sample. To ensure construct validity, I replicated Grandia's study and adapted her instrument to ensure instrumental validity. I tested item reliability using Cronbach's Alpha. Cronbach's Alpha was found to be 0.91815, indicating a high level of internal consistency among the items.

Summary

In this chapter, I presented methods that I used to examine federal KOs' affective commitments to changing their sustainable public procurement behaviors. I used an online survey adapted from Grandia's (2016) study to collect data from NCMA-affiliated DoD KOs, then analyzed data to answer my research question and tested a hypothesis that reported commitment to change will be positively related to reported sustainable public procurement behavior.

Chapter 4. Results

In this study, I explore how reported commitment to change influenced sustainable procurement behaviors (SPBs) among Department of Defense (DoD) contracting officers (KOs). Replicating Grandia's 2016 study, I used a survey aligned with U.S. Federal policies with NCMA members, targeting DoD KOs. The survey employed a Likert-type scale to measure KOs's sustainable procurement behaviors (SPBs) and their affective commitments to change (ACC). I employed multiple-regression analysis to examine the relationship between these variables while considering such demographic variables as age, education, and gender.

I received 110 completed surveys out of 188 initial respondents. The exclusion of survey respondents was predicated on the initial criterion that responders must have the position of a DoD KO. The respondents were excluded in the following manner, based on one or a combination of three selection criteria:

- Seven respondents were omitted from the study because they did not occupy the position of KO.
- A total of 26 respondents were excluded from the dataset due to their failure to have the required warrant.
- I excluded eighteen respondents without affiliation to the DoD.

Of qualifying respondents, 72 completed surveys constituted the final dataset for multiple regression analyses.

Analyses

Central Tendencies

I categorized the dataset in accordance with the following five variables:

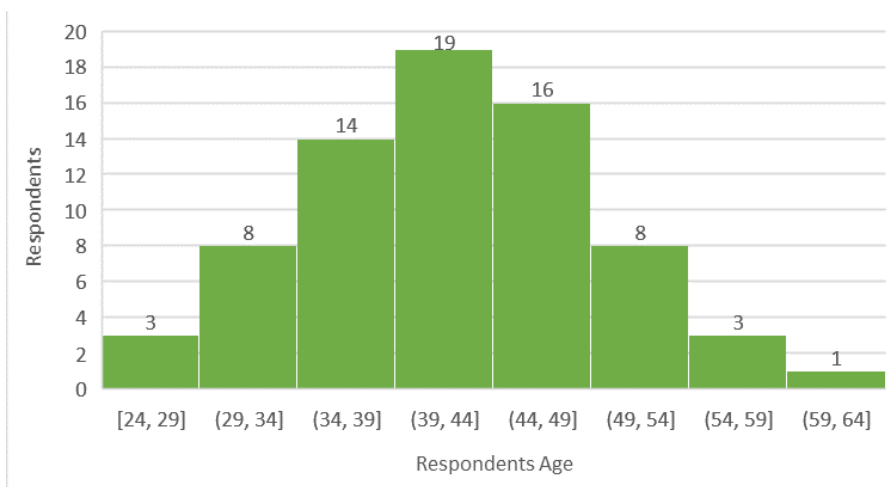
- Age,

- Gender,
- Education levels.
- Affective commitment to change (ACC) and
- Sustainable procurement behaviors (SPBs).

I identified the following four central tendencies.

Age. This distribution was skewed toward the mid-range age groups (Figure 3).

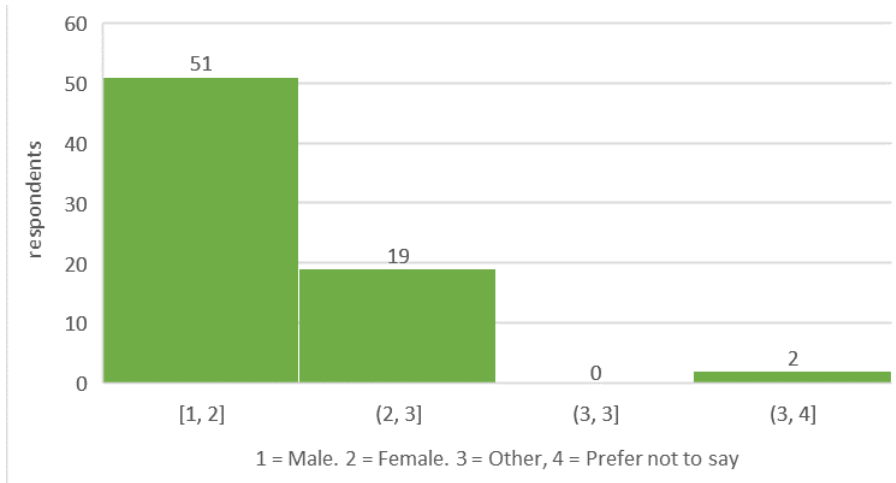
Figure 3. Central Tendencies: Age



The highest frequencies are seen in the age ranges 34–39 and 39–44, revealing the age ranges of the sample's median. There is a slight right skew in the distribution indicated by a fall in older age groups after a tapered increase of respondents up to the 39–44 age range.

Gender. This distribution was divided into four categories based on their self-identified genders (Figure 4).

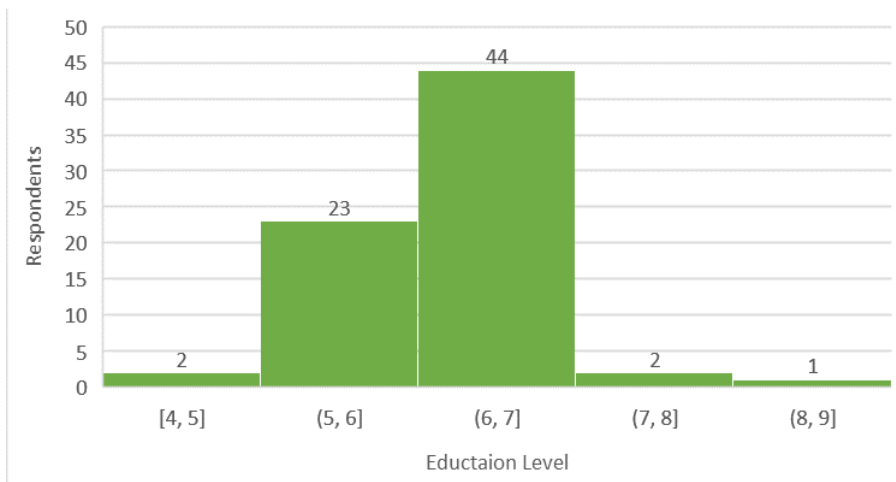
Figure 4. Central Tendencies: Gender



This distribution was skewed towards male respondents, of whom 51 identified as male and 19 as female. There was no representation from non-binary or gender non-conforming people. Two respondents selected “preferred not to say.” The histogram demonstrates the gender disparity in the participation pool, with most responses being male.

Education levels. This distribution showed a pronounced central tendency toward the master's degree level, Category 6 (Figure 5).

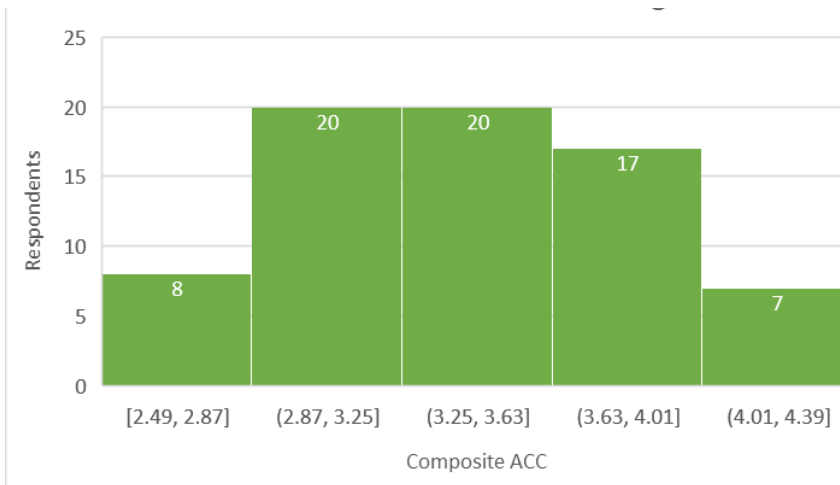
Figure 5. Central Tendencies: Education Levels



This distribution revealed a leftward skew, with fewer respondents reporting the lowest education levels. There is also a notable decrease in frequency moving toward the highest educational level, with the Doctorate, Category 8, having the lowest number of respondents.

Affective commitment to change. The variable for affective commitment to change (ACC) had a modest central tendency, as most scores fell within the interval of 2.87 to 3.63 (Figure 6).

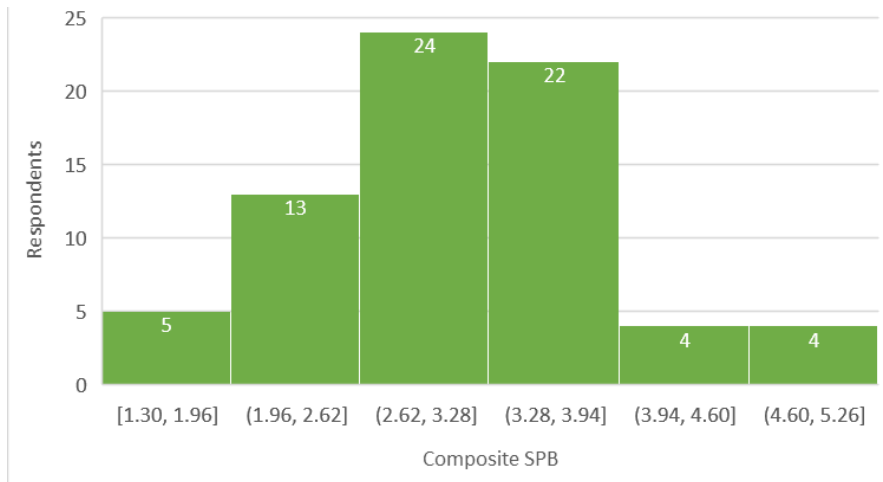
Figure 6. Central Tendencies: Affective Commitment to Change



This distribution had a mild left-skewed distribution, characterized by a noticeable tail in the lower bin 2.49 to 2.87 and a declining frequency. The top bin contains the fewest observations, 4.01 to 4.39.

Sustainable procurement behaviors. The dependent variable exhibited a moderate central tendency, predominantly falling between the intermediate range of 1.96 to 3.94 (Figure 7).

Figure 7. Central Tendencies: Sustainable Procurement Behaviors



This distribution exhibited a slight leftward skew, characterized by a reduced number of responses at the lower end of the scale and a more pronounced decrease in frequency as the scores increased.

Notwithstanding the evident asymmetry in the variables, these inconsequential departures from normality did not provide challenges for using multiple regression analysis. This approach exhibits robustness against minor deviations from normality, and even a modest skewness is improbable to significantly relate to the estimation of coefficients or the model's fit. This is backed by the central limit theorem, which ensures that the sample mean distribution approaches normality with a sufficient sample size surpassing 30 and random sampling.

Relationships

I determined that a parametric statistical test of multiple regression was justified. Table 1 shows that SPB and CAC were positively related.

Table 1. Regressions

<i>n</i>	Multiple R	R Square	Adjusted R Square	<i>SE</i>
72	0.48	0.23	0.19	0.71

These findings suggest a relationship between ACC and SPB. Based on the regression model, 23% of the variation in SPB can be explained ($R = 0.23$). Additionally, after considering the number of predictors, the adjusted R squared value of 0.19 indicates that the model predictors account for a portion of SPB variability. The standard error of the estimate is 0.71, representing the model's precision.

I analyzed variance (ANOVA), as shown in Table 2, to test the regression model's significance. The results indicated significance ($F(4, 67) = 5.13, p = .001$), suggesting that this set of predictors reliably distinguishes outcomes in SPB within our sample.

Table 2. ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>sig.</i>
Regression	4	10.27	2.57	5.13	0.00
Residual	67	33.54	0.50		
Total	71	43.82			

The sum of squares for the regression was 10.27 with a mean square of 2.57, compared to the residual sum of squares of 33.54 with a mean square of 0.50. These results suggest that the regression model provides a reliable prediction of SPB.

I computed a composite affective commitment (CAC) with a coefficient of 0.61, a standard error of 0.19, a *t*-statistic of 3.21, and a *p*-values (Table 3).

Table 3. Composite Affective Commitment (CAC)

	<i>r</i>	<i>SE</i>	<i>t</i> Stat	<i>p</i>	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3.24	1.15	2.81	0.00	0.94	5.55	0.94	5.55
CAC	0.61	0.19	3.21	0.00	0.23	0.98	0.23	0.98
Age	-0.01	0.01	-1.27	0.21	-0.04	0.01	-0.04	0.01
Gender	0.15	0.11	1.27	0.21	-0.08	0.37	-0.08	0.37
Education	-0.27	0.12	-2.19	0.03	-0.51	-0.02	-0.51	-0.02

The 95% confidence interval for the CAC coefficient, which ranges from 0.23 to 0.98, reinforced this predictor's significance. The interval's zero exclusion confirms the CAC coefficient's statistical significance at the 95% confidence level.

I found a significant negative coefficient for education level (Table 4).

Table 4. Education Level

Coefficient	SE	<i>t</i> -stat.	<i>p</i>
-0.27	0.12	-2.19	0.03

This finding suggests an inverse relationship between education level and SPB, wherein higher levels of education are associated with lower SPB. The 95% confidence interval for the education level coefficient, ranging from -0.51 to -0.02, does not include zero, indicating that the relationship of education level on SPB is statistically significant.

Table 5. Age & Gender

	Coefficients	SE	<i>t</i> -Stat	<i>p</i>	Lower 95%	Upper 95%
Age	-0.01	0.01	-1.27	0.209	-0.04	0.01
Gender	0.15	0.11	1.27	0.209	-0.08	0.37

Table 5 displays regression analysis results, showing that age and gender did not significantly relate to SPB. The coefficient for age was -0.01, with a standard error of 0.01, a *t*-

statistic of -1.27, and a p -value of 0.209, indicating that age was not a significant predictor of SPB. The 95% confidence interval for the age coefficient, which ranged from -0.04 to 0.01, includes zero, displaying that the effect of age on SPB is not statistically significant. Similarly, the coefficient for gender was 0.15, a standard error of 0.11, a t -statistic of 1.27, and a p -value of 0.21, which also did not indicate a statistically significant relationship between gender and SPB. The gender coefficient's 95% confidence interval spanned from -0.08 to 0.37, and zero in this range supports the absence of statistical significance.

Hypothesis

The hypothesis posited that a DoD KO's ACC would positively relate to their SPB. The analysis supported this hypothesis, revealing a statistically significant positive relationship between ACC and SPB. This result provides evidence of ACC influencing a DoD Contracting Officer's SPB. The analysis maintained an alpha level of 0.05, which reduced the possibility of Type I error. The p -value for CAC of 0.002 is below the threshold, decreasing the likelihood of a false positive. Regarding Type II error, false negative, the 72-observation sample size offered adequate power to identify relationships of variables with CAC.

Summary

In this study, I analyzed data from 72 surveys of contracting officers. I computed central tendencies among demographic variables of gender, age, and educational attainment and their relationships with SPBs, ACC, and CAC constructs. I found a positive correlation that was statistically significant between SPB and CAC. Unexpectedly, I identified a strong inverse association between SPB and education level.

Chapter 5. Conclusions, Implications, & Recommendations

In this study, I set out to analyze the sustainable procurement behaviors (SPBs) that U.S. Department of Defense (DoD) Contracting Officers (KOs) engage in DoD acquisitions. I aligned this study with Grandia's (2016) study to examine KOs' perceptions of U.S. Federal policies. I used an adapted version of her survey to reproduce some of its findings. Studying relationships among data on KOs' affective commitment to change (ACC) and SPBs furthers a growing conversation about sustainable procurement in the context of the DoD. I posed a research question about whether Federal KOs' reported commitments to change are related to their sustainable public procurement behaviors. I tested a hypothesis that a KO's reported commitment to change will be positively related to reported sustainable public procurement behavior.

I analyzed data from 72 DoD KOs and found that ACC and KO's SPB were positively related. KOs' SPB and education levels were inversely related, which implied that lower SPB may be linked to higher education. Self-identified gender and age variables had no discernible effects on SPB. These findings revealed the dynamics of sustainable procurement procedures among DoD KOs, with an emphasis on the role of the ACC in advancing such practices.

In this study, I used a survey instrument adapted from validated research. The p -value of 0.002 showed the significance of the found relationship between ACC and SPB. I meticulously controlled for some demographic variables to address potential biases, particularly those stemming from the diversity of participant characteristics, including participants' ages, levels of education, and genders.

Conclusions & Discussion

The results supported my hypothesis that ACC and SPB among DoD KOs were positively related. The data revealed that KOs receptive to supporting change are more inclined to conduct themselves in a manner that aligns with sustainable procurement procedures. This aligns with Ajzen's theory of planned behavior (TPB), which posits the probability that a particular activity can be anticipated by considering its intention. ACC illustrates intentionality in which KOs are motivated to adjust due to their optimistic perceptions of the outcomes.

The results indicated that ACC could explain 23% of the variance in SPB. Although ACC was related to SPB, the model does not account for other variables that may relate to SPB. In this study, higher SPB was not proportional to education level, as indicated by the unexpected inverse relationship between the two variables. These results could indicate possible misalignment between curriculum and sustainable procurement practices. More highly educated KOs may have relied excessively on conventional procurement practices or have had less practical experience with procurement.

The lack of significant findings related to age and gender suggests that these demographic variables did not contribute to differences in SPB among KOs. I conclude that demographic attributes may provide insights into the workforce's makeup but may not reflect views and conduct about sustainable procurement procedures.

Implications

I draw the following three implications from this study: first, theoretical implications for sustainable procurement and organizational change that reinforce the theory of planned behavior (TPB) within sustainable procurement. The positive relationship between ACC and SPB implies that KOs' attitudes toward sustainability predict their behavior. This implication

aligns with TPB, which emphasizes the role of intention, in this case, ACC, in performing a specific behavior.

A second theoretical implication is that an inverse relationship between education levels and SPB challenges assumptions within organizational change theory. My findings imply that existing educational practices may require reassessment toward training programs that better align with sustainable procurement goals, along with a re-examination of KOs' continuing education policies to emphasize sustainability.

A third implication is in policymaking: this study provides actionable data for the DoD to enhance its policies for sustainable procurement. The relationship between ACC and SPB implies that should the DoD support a stronger ACC among KOs; it may witness a commensurate rise in SPBs. If traditional demographic characteristics, such as gender and age, could not be predictors of SPBs, with implications for recruitment and training.

Recommendations

Stakeholders

I recommend that the DoD use approaches that improve the ACC of KOs toward sustainability. This objective can be accomplished by implementing awareness initiatives highlighting sustainable procurement's environmental advantages. The DoD leadership should design training programs to impart information and address sustainable acquisitions' pragmatic elements. These initiatives may successfully harmonize individual values with the sustainability objectives of the DoD. By integrating sustainable procurement metrics into performance evaluations, leadership might inspire KOs to adopt more proactive approaches towards sustainable practices and give them precedence during operational obligations.

Policymakers

Policymakers should develop and execute policies that promote ACC. One potential approach is to provide incentives to promote sustainable procurement and acknowledge teams or individuals that exhibit exceptional performance in this domain. The results indicating a negative relationship between level of education and SPB indicate that educational prerequisites should be reconsidered. To properly prepare KOs for sustainable procurement, policymakers must contemplate endorsing redesigned educational curricula prioritizing hands-on sustainability training.

Researchers

Additional research is necessary to comprehend the relationship between higher levels of education and a reduced SPB. This dynamic should be investigated to guide the creation of more efficient educational procedures and programs. Implementing cross-cultural investigations may prove advantageous when contrasting these results with sustainable procurement practices in diverse nations or cultural milieus. These studies may aid in generalizing results or shed light on the relationships among cultural variables and purchasing practices. It is advisable to conduct replication studies in alternative organizational settings or other government departments. Such studies should seek to reproduce these results along with those by Grandia (2016).

Limitations

My study of DoD KOs had the following six limitations. The first constraint was dependence on self-reported data acquired by a survey. These data were prone to social desirability bias. Participants may provide responses corresponding with their preconceived notions of social acceptability instead of reflecting their views or behaviors.

Second, this study was limited by its one-shot, short-term cross-sectional survey design. It did not longitudinally measure changes in KOs' SPB and ACC. Third, I did not examine considerations that affect SPB and ACC among KOs in the absence of qualitative data.

Fourth, I did not study alternate explanations for the inverse relation between SPB and education level. I accounted for demographic characteristics, including age, education, and gender, but omitted other potentially influential considerations such as years of experience, roles among KOs with advanced degrees, or organizational culture and support.

A fifth limitation was low control for non-response bias. This study's sample was restricted to KOs who voluntarily agreed to participate, possibly overlooking diverse viewpoints from individuals with different degrees of dedication or conduct.

The sixth limitation was the external validity of results from the U.S. DoD. Results may not have direct relevance to other governmental entities, the private sector, or global settings characterized by distinct procurement policies and cultural norms.

Summary

I conclude that ACC influenced SPBs among this sample of DoD KOs. Adapting Grandia's (2016) research to the U.S. Federal context, I found a positive relation between ACC and SPB, affirming the TPB. I also found an unanticipated inverse relationship between the education levels of KOs and SPB, which challenged established beliefs regarding the significance of education in promoting sustainability practices. The absence of similar relationships with age and gender on SPB indicated that these demographic variables did not play a crucial role in determining the SPB of KOs.

Theoretically, the results support the TPB in the context of sustainable procurement and call into question established notions in organizational change theory. Increasing SPBs

could improve ACC among KOs for DoD. I recommend that policymakers establish policies that encourage ACC and sustainability instruction. I also recommend further research on SPB and educational attainment.

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Appendix A. Department of Defense Procurement

Sustainability in United States Federal Procurement began during the Ford Administration as the President passed two Acts of Congress into law and issued one Executive Order (E.O.). The law that seeded the DoD Sustainable Procurement Program (SSP) is the Energy Policy and Conservation Act (EPCA). On December 22, 1975, Public Law 94-163 enacted the EPCA (Energy Policy and Conservation Act, 1975). Section 6361(a)(1) of Title 42 U.S.C. mandates that the President establish mandatory energy efficiency and conservation standards that govern Federal procurement decisions and policies (Energy Policy and Conservation Act, 2017).

The EPCA was followed by E.O. 11912 Delegation of Authorities Relating to Energy Policy and Conservation, issued by President Ford on April 13, 1976 (Ford, 1976). The E.O. requires the Administrator of the Office of Federal Procurement Policy (OFPP) to provide policy guidance for the application of energy conservation and efficiency standards in the Federal procurement process under 42 U.S.C. 6361(a)(1) (Ford, 1976).

The same year, on October 21, legislation known as the Resource Conservation and Recovery Act (RCRA) was signed into Public Law 94 580 (Resource Conservation and Recovery Act of 1976 [RCRA] 1976). RCRA mandates that Federal agencies prioritize resource recovery and energy-efficient procurement practices. It also directs the Environmental Protection Agency (EPA) to develop policies and procedures to promote energy conservation and resource recovery (RCRA, 1976).

The congressional finding under 42 U.S.C. 6901 et seq. lays the groundwork for procuring renewable energy and environmentally preferable products manufactured with recovered materials. Under 42 U.S.C 6901(a), Congress determined a need to develop alternative

energy sources to reduce reliance on nuclear and hydroelectric generation, natural gas, and petroleum products, with solid waste as a potential energy conversion source (RCRA, 2017). Per 42 U.S.C. 6901(c), recovering valuable materials using existing methods to separate usable materials from solid waste can lessen the United States' reliance on foreign sources for these materials (RCRA, 2017).

RCRA gives further instruction under 42 U.S.C. 6962 Federal Procurement. 42 U.S.C. 6962 establishes compliance guidelines for the acquisition of items within a monetary threshold. Section 6962 requires procuring agencies to comply with the provisions of this section, which requires the preparation and revision of guidelines for all procurements exceeding \$10,000. (RCRA, 2017).

The guidelines designate items for procuring manufactured products with recovered materials, the maximum use of recycled paper, recommendations for levels of recovered materials, and procurement practices for vendor certification on the proportion of recovered materials in an item (RCRA, 2017). Guidelines also provide information regarding the availability of recovered materials and end products and their relative cost and performance (RCRA, 2017). There are three primary areas of compliance requirements.

42 U.S.C. 6962 mandates, following the guidelines, that each procuring agency acquires designated items comprised of the highest practicable percentage of recovered materials while maintaining adequate competition (RCRA, 2017). An agency may decide only to acquire items if they are reasonably available, priced, or meet performance requirements (RCRA, 2017). The section directs KOs to require vendor certification of the percentage of recovered materials and to estimate the proportion of total recovered materials used on contracts awarded for more than \$100,000. (RCRA, 2017). Agencies capable of using energy or fuels derived

from solid waste must do so as a primary or supplementary energy source to the greatest extent possible (RCRA, 2017).

RCRA incorporates recycled materials and renewable energy into sustainable purchasing. Under President Ford, the EPCA granted the President the authority to mandate sustainable procurement. E.O. 11912 directs the OFPP Administrator to provide policy guidance for the procurement process using this authority.

President Carter issued subsequent government authorities. Moreover, his administration ushered in the National Energy Conservation Policy Act (NECPA) and Federal Energy Management and Planning Programs (FEMPP). NECPA was enacted on November 9, 1978, as Public Law 95-169 to regulate interstate commerce, reduce energy demand growth, and conserve nonrenewable energy resources without impeding economic growth (National Energy Conservation Policy Act [NECPA], 1978).

NECPA has four codified sections that affect sustainability in federal procurement.

1. NECPA has four codified sections that affect sustainability in federal procurement. Per 42 U.S.C. 8253 mandates, the Energy Management Requirements mandate for Federal building energy performance and management requirements require consideration for both in the acquisition or recommissioning of real property (NECPA, 2017). Federal procurement of energy-efficient products 42 U.S.C. 8259b introduces Energy Star and Federal Energy Management Program products and requirements to incorporate specifications for those products involving the consumption of energy in acquisition planning (NECPA, 2017). Title 42 U.S.C. section 8262g directs the Administrator of General Services, Secretary of Defense, and Director of the Defense Logistics Agency to undertake an energy-efficient products procurement program and to implement the program after consulting the Secretary of Energy (NECPA,

2017). The agenda will include identifying energy-efficient products that offer significant potential savings, to be reported to Congress by the Secretary of Energy (NECPA, 2017). The authority to enter contracts solely to achieve energy savings and benefits is given to all Federal agency heads under 42 U.S.C. 8287 (NECPA, 2017).

The FEMMP appeared as a final rule under Federal Register volume 44, page 60669, on October 19, 1979, during the Carter Administration (Federal Energy Management and Planning Programs [FEMPP], 1979). The FEMMP was issued under the authority of the EPCA and E.O. 11912 to promote energy-efficient buildings and renewable energy with consideration for life-cycle costs and to expand the sustainable energy job market (FEMPP, 1979). The FEMMP is published under Title 10, Part 436 of the Code of Federal Regulations (FEMPP, 2018). As the FEMPP relates to sustainable procurement, its objective is to encourage Federal agencies to utilize energy savings performance contracts. The FEMPP provides guidelines for energy savings performance contracts (FEMPP, 2018). However, they only apply to contracts awarded before September 30, 2003 (FEMPP, 2018). Under 42 U.S.C. 8259b, the FEMPP publishes into regulation the Energy Star and Federal Energy Management Program products discussed earlier in this paper (FEMPP, 2018). The next presidential administration introduced the Federal Acquisition Regulation (FAR) and the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA).

In this discussion, I aim to identify when the FAR went into effect. During the Reagan Administration, the FAR, the primary document of the federal acquisition system, was published (Federal Acquisition Regulation [FAR], 2018). The FAR was established as new Chapter 1 of Title 48 of the Code of Federal Regulations with a final rule posted in the Office of the Federal Register on September 19, 1983, and the first CFR edition was published on October

1, 1984. (FAR, 1983). The FAR established a single regulation for all executive agencies to acquire supplies and services using appropriate funds (FAR, 1983). The FAR is codified in Title 48, Parts 1 through 53 of the Code of Federal Regulations, which governs the federal government's acquisition of goods and services (Lunder et al., 2015). Another congressional act was passed into law under President Reagan.

The Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) was enacted into Public Law 99-499 on October 17, 1986, under Title III of the Superfund Amendments and Reauthorization Act of 1986 (Superfund Amendments and Reauthorization Act of 1986 [SARA], 1986). EPCRA addresses the environmental and safety risks associated with storing and handling toxic chemicals, considering the substances acquired for facilities and the storage thresholds for procurement (SARA, 1986). Under George H.W. Bush, three laws were enacted regarding environmentally friendly products, ozone-friendly alternatives, and alternative fuels.

In November 1990, the Pollution Prevention Act (PPA) was passed by Congress as part of the Omnibus Budget Reconciliation Act of 1990 Public Law 101-508 (Omnibus Budget Reconciliation Act of 1990 [OBRA], 1990). PPA mandated the creation of an office by the EPA to promote pollution prevention through source reduction, providing a measurement source for federal agencies. It also required operators of facilities to submit annual reports on toxic chemical source reduction and recycling by SARA regulations (OBRA, 1990). The PPA, codified under Title 42 U.S.C. Section 13101, establishes a policy prioritizing pollution prevention and reduction at its source, with disposal only considered a last resort. This sets the foundation for encouraging the purchase of friendly products and services (OBRA, 2017).

The inclusion of Title VI Stratospheric Ozone and Global Climate Protection in Public Law 101-549 on November 15, 1990, aimed to safeguard the ozone layer (Clean Air Act, 1990). Sections 42 U.S.C. 7671 and 7671(a) provide definitions and enlist class I substances that threaten the stratospheric ozone layer (Clean Air Act, 2017). Section 7671(c) mandates the gradual elimination of the production and consumption of class I substances (Clean Air Act, 2017). Moreover, under 42 U.S.C. 76711, federal procurement regulations necessitate prioritizing substituting alternatives for class I substances (Clean Air Act, 2017).

On October 24, 1992, the Energy Policy Act was enacted into Public Law 102-486 (Energy Policy Act of 1992 [Energy Policy Act], 1992). The Energy Policy Act aims to promote, to the greatest extent possible, the Federal Government's energy conservation and efficient use of renewable energy sources (Energy Policy Act, 1992). The Energy Policy Act (2017), codified under Title 42 USC Section 13211, defines alternative fuels by giving percentages and chemicals that qualify and definitions for alternative fleet vehicles. The above-mentioned definitions provide Federal Acquisition Professionals with the definitions required to purchase eco-friendly fuels and vehicles. President Clinton's Administration provided one more Government Authority that affected sustainability in federal procurement.

Public Law 105-85, the National Defense Authorization Act for Fiscal Year 1998 (1997), was enacted by Congress on November 18, 1997. Section 350 of Public Law 105-85 requires the DoD KOs, with exceptions to cost and requirement, to procure copying paper with recycled content at 20 percent as of January 1998 and increasing to 50 percent as of January 2004 (National Defense Authorization Act for Fiscal Year 1998, 1997). President W. Bush issued two Executive Orders, and Congress enacted three sustainability laws during his administration.

President George W. Bush (2001) issued EO 1222 Energy Efficient Standby Power Devices on July 31, 2001. The EO directs to purchasing only commercial products that utilize only one watt in their external or internal standby power functions. EO 12221 does make an exception concerning product availability but further directs procuring the next lowest wattage (Bush, 2001).

Congress enacted the Farm Security and Rural Investment Act of 2002 on May 13, 2002 (Farm Security and Rural Investment Act of 2002 [FSRIA], 2002). The FSRIA (2002) defines biobased products and procurement requirement thresholds and directs procurement preference for biobased products. A biobased product is a nonedible commercial or industrial product mainly composed of the biological effects of renewable domestic forestry or agricultural materials (FSRIA, 2002). FSRIA (2013) Biobased markets program codified under Title 7 USC Section 8102 directs the application for preference for biobased products in all procurements exceeding \$10,000 or having quantities totaling \$10,000 if they are reasonably priced, readily available, and meet the requirements.

The Energy Policy Act of 2005 was enacted on August 8, 2005, as Public Law 109-58. (Energy Policy Act, 2005). The Energy Policy Act of 2005, codified at 42 U.S. Code Section 6966, mandates the increased use of recovered mineral components in federal procurements involving cement or concrete (Energy Policy Act, 2017).

Strengthening Federal Environmental, Energy, and Transportation Management, issued on January 24, 2007, directs policy implementation, goals, and FAR amendments (Bush, 2007). The 2007 Executive Order 13423 issued by President George W. Bush mandates that Federal Agencies conduct their missions in an environmentally, economically, and sustainably responsible manner. In support of U.S. policy, agencies shall establish and implement a policy

for sustainable acquisitions of goods and services and any necessary amendments to the FAR (Bush, 2007).

The Energy Independence and Security Act of 2007, also known as Public Law 110-140 (Energy Independence and Security Act of 2007 [EISA], 2007), was put into effect on December 17, 2007. The EISA has purposes, one of which is to improve the fuel efficiency of vehicles (EISA, 2007). Section 141 of the EISCA modifies the Energy Policy Act of 1992 by guiding the procurement of vehicles with low greenhouse gas emissions. This guidance excludes acquisitions based on availability and cost-effectiveness (EISA, 2007).

On March 11, 2009, President Obama started his administration by enacting Public Law 111-8, the Omnibus Appropriations Act of 2009 (Omnibus Appropriations Act, 2009). This law encompasses nine appropriations acts. In this study, we delve into the four acts related to sustainability that are included in this legislation:

- Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2009
- Financial Services and General Government Appropriations Act, 2009
- Department of the Interior, Environment, and Related Agencies Appropriations Act, 2009
- Department of State, Foreign Operations, and Related Programs Appropriations Act, 2009

The Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act of 2009 contributes to initiatives for promoting sustainability. This Act ensures that funds will be available until utilized to assist in managing hazardous materials on Federal lands (Public Law 111–8 Mar. 11, 2009, 123 STAT. 527). It specifically

designates funds for research and education in agriculture under section 7 U.S.C. 5811 (Public Law 111–8 Mar. 11, 2009, 123 STAT. 530), highlighting its commitment to supporting agricultural practices. The Act also provides appropriations for agriculture programs outlined in section 3(d) of the Smith Lever Act by allocating program funding and payments related to these sustainability initiatives (Public Law 111–8, Mar. 11, 2009, 123 STAT. 527). These sections emphasize the Act's objective of promoting sustainable development in the agricultural sector by ensuring environmental compliance and enhancing sustainable agricultural practices.

Section 706 of the Financial Services and General Government Appropriations Act of 2009 contains requirements for sustainability throughout federal agencies. The Act granted authority to Federal agencies to receive and utilize funds from the sale of recovered materials from recycling or waste prevention initiatives. The section designated appropriations for acquisition, waste reduction, prevention, and recycling programs and the development and implementation of pollution and hazardous waste prevention programs. By reinvesting the revenues generated from waste avoidance and recycling into environmental projects, this section implies a strategic approach to sustainable practices throughout the federal government (Public Law 111–8, March 11, 2009, 123 STAT. 681).

The Appropriations Act of 2009 for the Department of the Interior, Environment, and Related Agencies pertains to the Forest Service's sustainable rural development. The Act designates funding for the Forest Service to utilize natural resource-based enterprises and rural communities. The allocated funds are to provide technical support for sustainable rural development. By allocating Forest Service resources, this component of the Act emphasizes the government's effort to promote sustainable development in rural areas (Public Law 111–8, 11 March 2009, 123 STAT. 734).

The Department of State, Foreign Operations, and Related Programs Appropriations Act, 2009, incorporates provisions for international environmental and sustainable development initiatives. Section 7032(a) of the Act empowers the President to sell, reduce, or cancel pre-1995 concessional loans, mandating that in debt buybacks, the eligible country allocate at least 40% of the price to activities for conservation and sustainable use of natural resources (Public Law 111–8, Mar. 11, 2009, 123 STAT. 875). Section 7071 emphasizes sustainable development and environmental conservation in Tibetan communities with a specific allocation for non-governmental organizations to preserve cultural traditions and foster sustainable development in Tibetan areas (Public Law 111–8, Mar. 11, 2009, 123 STAT. 903).

Section 7083 of the Act deals with the pressing environmental issues. It provides financial resources to the United States Agency for International Development specifically for programs that aim to reduce global warming using renewable energy and energy-efficient technologies (Public Law 111–8 Mar. 11, 2009, 123 STAT. 911). The Act also designates funds to support climate change initiatives in the Developed Countries Fund, which is concentrated on preserving biodiversity, such as tropical forests and wildlife. Additionally, it supports conservation efforts in the Amazon Basin and promotes collaboration through the Congo Basin Forest Partnership (Public Law 111–8 Mar. 11, 2009, 123 STAT. 911).

The Omnibus Appropriations Act of 2009 was followed by Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance, issued by President Obama on October 8, 2009 (Obama, 2009). The purpose of Executive Order 13514 is to build an integrated strategy for sustainability throughout the Federal Government and give Federal agencies priority to reducing greenhouse gas emissions (Obama, 2009, p. 52117).

Achieving the Executive Order's purpose is aided by sustainable acquisitions and is discussed in policy and agency goals.

Executive Order 13514 delineates a policy that pertains to the utilization of acquisitions to advance sustainability objectives within the Federal Government. This strategy entails leveraging acquisitions of sustainable technology, materials, products, and ecologically preferable services to cultivate sustainable markets. The policy comprehensively includes increasing energy efficiency, reducing greenhouse gas emissions, conserving water resources, and managing waste effectively (Obama, 2009, p. 52117). The Agency Goals section of Executive Order 13514 addresses collaboration between agencies and contractors to develop and integrate incentives to mitigate greenhouse gas emissions. This collaboration concentrated on enhancements in manufacturing processes, utility and delivery services, transportation methods, and supply chain activities to achieve environmental sustainability (Obama, 2009, p. 52117).

The Obama Administration issued Executive Order 13693, Planning for Federal Sustainability in the Next Decade, on March 19, 2015 (Obama, 2015). To continue the Federal government's leadership in sustainability and reduce greenhouse gas emissions through a combination of Federal operations, including sustainable acquisitions (Obama, 2015, p.15871).

In section 3 of Executive Order 13693, the agency's goals are to implement a policy for areas of sustainable acquisitions to include renewable energy, leasing, statutory mandates, EPA programs, and the purchase of environmentally preferable products. Agencies are to contract to install renewable energy and retain corresponding Renewable Energy Certificates (REC), acquire equal value replacement RECs, and purchase electricity and RECs directly or as replacements (Obama, 2015, pp.15872 - 15873). Agencies are to implement policy to include energy efficiency criteria in specifications or as a source-selection evaluation variable with

building lessors' requirements to disclose carbon emissions or energy consumption data for the agency-occupied portion in lease solicitations over 10,000 square feet (Obama, 2015, p.15874). Statutory requirements require purchase preferences for products and services that conserve energy and water, including those with the ENERGY STAR and Federal Energy Management Program (FEMP) labels, as well as biobased and recycled content products approved by the EPA (Obama, 2015, p.15875). The EPA programs recommend purchasing sustainable products and services, including Significant New Alternative Policy (SNAP) chemicals or alternatives to ozone-depleting substances, WaterSense-certified products, Safer Choice labeled products, and SmartWay Transport partners and products (Obama, 2015, p.15875). The purchase of environmentally preferable products or services is mandated for either those that meet or exceed EPA-recommended specifications, standards, or labels or those that meet environmental performance criteria developed by voluntary consensus standards bodies (Obama, 2015, p.15874).

On June 10, 2015, the President of the United States (2015) issued instructions Implementing Instructions for Executive Order 13693, Planning for Federal Sustainability in the Next Decade. The purpose of this document is to guide federal agencies on how to implement E.O. 13693, which concentrated on planning for sustainable government practices (Obama, 2015, p. 1). This document reinforces the requirements set by law for the EPA's procurement programs, defines appropriate products and services that promote sustainability in acquisitions, and outlines how to implement these sustainable practices through training (Obama, 2015, pp. 53 60).

DoD Instruction 5000.02 Operation of the Defense Acquisition System was issued on January 7, 2015 (United States Department of Defense [DoD], 2015). The directive implemented

revised protocols for overseeing acquisition initiatives while allowing Milestone Decision Authorities the latitude to customize acquisition processes and regulatory obligations to fulfill program goals while adhering to legal constraints (DoD, 2015, p. 1). Sustainable acquisitions are not explicitly mentioned in the instructions. Program Managers must integrate risk management into a system's life cycle, including testing, fielding, and system support, to account for environmental effects (DoD, 2015, pp. 87-88). The requirements do not promote sustainable acquisition techniques; they prioritize compliance and risk management to ensure that environmental considerations are incorporated into the process.

On September 7, 2016, the DoD released the Strategic Sustainability Performance Plan (SSPP), a revision of previous SSPPs (DoD, 2016). The SSPP served as a framework for the future and an update on progress toward four sustainability objectives through the fiscal year 2025: continued availability of critical resources, readiness maintained in the face of climate change, waste, and pollution minimized, and management and practices built on sustainability and community (DoD, 2016, p. 5). Sustainability in acquisitions is a goal within SSPP under the fourth objective. This objective centers on enhancing the DoD's mission by implementing management methods and policies grounded in community engagement and sustainability (DoD, 2016, p. 38).

The SSPP outlines the overarching objective of standardizing sustainability practices, with the acquisition of sustainable goods and services as a subsidiary aim. The SSPP addresses the DoD's endeavors to propose modifications to the Federal Procurement Data System to facilitate monitoring all sustainable procurement data, and new instruction outlines procurement preferences, contract requirements, training, and evaluation processes for sustainable procurement (DoD, 2016, pp. 38 & 57).

In 2017, under the Trump administration, the DoD released the most recent edition of the Defense Acquisition Guidebook (DAG) on March 3rd (DoD, 2017). The purpose of the DAG is to complement DoD Instruction 5000.02 and Directive 5000.01 by providing the acquisition workforce with discretionary best practices. The guidance included in the DAG is intended to be customized for every acquisition program following the DoD directive and instruction's fundamental concepts and procedures. The guidebook encompasses a broad range of topics. Specific chapters emphasize overarching discussions to enhance program planning effectiveness, while others function as tutorials on implementing these concepts within the acquisition framework. Chapters may contain background material, tutorial discussions, and specific criteria for milestone decisions and phases, contingent upon the topic (DoD, 2017, p. 2). The DAG is silent on environmental considerations for procurement. It defines sustainability in terms of cost, impact, and resource utilization over a system's life cycle, and sustainment is the end user's ability to maintain and operate the system post-deployment (DoD, 2017, p. 396).

Under the Trump Administration, on July 1, 2018, the Environmental Protection Agency published Title 40, Part 82 of the Code of Federal Regulations on stratospheric ozone protection (40 CFR 82, 2018). The primary objective of Title 40, Part 82 of the Code of Federal Regulations, delineated across its nine subparts, is to protect and preserve the stratospheric ozone layer by implementing the provisions of the Clean Air Act Amendments of 1990 (40 CFR 82, 2018, pp. 7, 87, 110, 115, 116, 127, 222, 307, 309). The regulation seeks to protect the ozone layer by controlling the production, use, and disposal of ozone-depleting substances, promoting safer alternatives, and implementing specific bans and labeling requirements (40 CFR 82, 2018).

Section 82.84 of Title 40 of the Code of Federal Regulations mandates incorporating environmental variables into procurement policies and practices to safeguard the stratospheric ozone layer. By requiring adherence to Title VI of the Clean Air Act, this provision ensures that federal procurement processes are consistent with environmental protection objectives (40 CFR 82, 2018, p. 116). As specified in subsection 82.84(a), federal procurement requirements necessitate, whenever possible, the substitution of ozone-depleting compounds with safer alternatives. Furthermore, the regulation mandates adherence to the phase-out timetables for ozone-depleting compounds. Procurement at the federal level must evolve and adjust to accommodate the elimination and gradual reduction of these compounds. In addition, any new or ongoing contracts for services or activities under the Clean Air Act must include or be modified to include conditions for contractor compliance (40 CFR 82, 2018, p. 116),

A Federal Acquisition Regulation (FAR) update was issued during the Trump administration through Federal Acquisition Circular Number 2005-100, published on August 22, 2018 (Federal Acquisition Regulation, 2018). The FAR regulates acquisitions by the Federal Government and is codified in Title 48, Parts 1 through 53. From acquisition planning to contract formulation and management, the FAR specifies the acquisition process and establishes the guiding principles for the federal acquisition system (Lunder et al., 2015, p. 1). Environmental considerations for sustainability in federal procurement are published in FAR Part 23 Environment, Energy and Water Efficiency, Renewable Energy Technologies, Occupational Safety, and Drug-Free Workplace.

According to FAR 23.1(a), the Sustainable Acquisition Policy mandates that federal agencies prioritize sustainability in their procurement processes. It requires that 95 percent of new contracts for products or services, including construction, stipulate that the products

acquired must be energy-efficient, water-efficient, biobased, environmentally preferable, non-ozone depleting, or manufactured using recovered materials (FAR, 2018, pp. 23-1 – 23-2).

Policies and procedures for acquiring energy and water-efficient products and services are prescribed under FAR 23.2. Per FAR 23.203. Unless exempt, Federal agencies must purchase products designated as ENERGY STAR® or FEMP when acquiring products listed in the ENERGY STAR® Program or the FEMP if products from FEMP's Low Standby Power list are unavailable. Agencies must purchase alternatives with a standby wattage of no more than one watt or that match the recommended standby wattage (FAR, 2018, p. 23.2-1).

The policy for using recovered materials and biobased products in government procurement, as outlined in FAR 23.4, dictates consideration of cost, availability, competition, and performance variables within prescribed thresholds. Federal agencies must adhere to the procurement procedures for items specified by the United States Department of Agriculture (USDA) or the EPA when the price of a single item is over \$10,000 or when the total expenditure for the preceding fiscal year exceeds \$10,000. Under FAR 23.403, Federal agencies must procure the specified recovered materials and biobased products within the thresholds or ensure their utilization in contracted services. Also, Federal agencies must identify that products contain the highest feasible percentage of recovered or biobased content, ensuring they at least meet, but may exceed, the minimum standards set by the EPA or USDA. As required by FAR 23.4, the acquisition of these products should be conducted to balance their functional utility, intended function, and market competition. Competitive procurement processes are to be utilized to ensure cost-effectiveness and adherence to the agency's performance standards (FAR, 2018, p. 23.4-1).

FAR 23.7 directs agencies to implement programs and set goals for obtaining environmentally preferable products and services (FAR, 2018). As detailed in FAR 23.703, the regulation requires agencies to implement contracting preference programs to acquire ecologically preferable products and services, focusing on energy efficiency and water conservation (FAR, 2018). To accomplish this, agencies must employ acquisition strategies that support several critical environmental objectives. The goals encompass optimizing the utilization of environmentally preferred items, increasing energy efficiency and water conservation, reducing the formation of hazardous waste, and attaining cost savings across the whole life cycle (FAR, 2018, p. 23.7-2).

Under FAR 23.8, policies and procedures for minimizing the acquisition of ozone-depleting compounds are specified. According to FAR 23.802, the policy requires federal agencies to develop economically viable initiatives that minimize the acquisition of substances and materials that contribute to the depletion of the stratospheric ozone layer. In doing so, the agencies should prioritize procuring alternative chemicals, products, and manufacturing processes that pose fewer environmental hazards (FAR, 2018, p. 23.8-1). Acquisition document preparation procedures must adhere to the Clean Air Act and, if possible, give precedence to substituting appropriate alternatives for ozone-depleting compounds (FAR, 2018, p. 23.8-1). Contractors must utilize alternatives to hydrofluorocarbons with high global warming potential in their products and services whenever feasible. Contractors may consult the additional tables of other options and the SNAP program of the EPA, found in 40 CFR part 82, subpart G, for a list (FAR, 2018, p. 23.8-1).

The DoD sustainable procurement program was officially established by issuing DoD Instruction 4105.72, which concentrated on procuring goods and services. An amendment to

this instruction, effective August 31, 2018, was published on September 7, 2016. The primary purpose of this instruction is to set policies, define responsibilities, and outline procurement procedures for incorporating practices in DoD activities. It aims to reduce the impact and overall costs associated with DoD operations. The directive also led to the formation of the DoD SPP Working Group, responsible for identifying and addressing any challenges related to implementing the sustainable procurement program within the DoD. It is important to note that this instruction applies explicitly to DoD operations.

The guidelines outlined in DoD Instruction 4105.72 apply to entities within the Department of Defense (DoD) such as the "Office of the Secretary of Defense Military Departments, the Joint Chiefs of Staff and Joint Staff Combatant Commands, Office of the Inspector General, Defense Agencies DoD Field Activities and other organizational entities within DoD..." (DoD, 2018, p. 3). This directive is intended explicitly for installations and activities within the United States and its territories as per country regulatory standards. However, it may also apply to overseas sites if deemed beneficial by the head of a DoD component (DoD, 2018). Contractors engaged in operating or procuring supplies for DoD sites, including those located overseas, must comply with this directive upon certification by the DoD Component head that such implementation is in the best interest of the United States. Contractors must adhere to this directive when working and acquiring resources for DoD sites, even if these sites are located outside of the United States. However, this implementation will only take place if the head of the DoD Component certifies that it is in the interest of the United States.

DoD Instruction 4105.72 does not pertain to the procurement of alternative fuels, weapon systems, or non-appropriated monies, except for the procurement mentioned above (DoD, 2018). DoD Instruction 5000.02 and the Defense Procurement Guidebook contains

requirements for environmental-impact studies and guidelines for acquiring weapon systems (DoD, 2018). The 2012 Memorandum of Operational Energy Plans and Programs of the Assistant Secretary of Defense oversees the procurement of alternative fuels for operational platforms (DoD, 2018). Hence, while weapons systems and alternative fuels utilized for operating platforms contribute to sustainability efforts, they do not fall under the scope of DoD Instruction 4105.72.

The DoD shall prioritize purchasing sustainable goods and services that utilize or provide sustainable goods, as stated in DoDI 4105.72. (DoD, 2018). It is worth noting that the verb "will" is employed in place of "shall." The future tense of "will" signifies a disposition or intention to act in the future. That contrasts with "shall," which connotes a duty. The preference is granted except for services or products unavailable for competitive purchase due to unreasonable performance standards, price, or schedule (DoD, 2018). In addition, the DoD will implement a sustainable procurement program by federal and DoD policy and standards as outlined in thirteen distinct public laws, federal regulations, Executive Orders, DoD directives, instructions, and other documents, as required by DoDI 4105.72. (DoD, 2018).

Timeline

- President Ford Administration, 8/9/1974 - 1/20/1977
 - December 22, 1975 - Public Law 94-163 Energy Policy and Conservation Act
 - April 13, 1976 - Executive Order 11912 Delegations of Authority under the Energy Policy and Conservation Act
 - October 21, 1976 - Public Law 94-580 Resource Conservation Recovery Act of 1976

- President Carter Administration, 1/20/1977 - 1/20/1981
 - November 9, 1978 - Public Law 95-619 National Energy Conservation Policy Act
 - October 19, 1979 - Code of Federal Regulations, Title 10, Part 436 – Energy, Federal Energy Management and Planning Programs
- President Reagan Administration, 1/20/1981 - 1/20/1989
 - October 1, 1984 – Code of Federal Regulations, Title 48 - Federal Acquisition Regulations - First Publication
 - October 17, 1986 - Public Law 99-449 Emergency Planning and Community Right-to-Know Act of 1986
- President H. W. Bush Administration, 1/20/1989 - 1/20/1993
 - November 5, 1990 - Pollution Prevention Act of 1990 - Public Law 101-508
 - November 15, 1990 - Public Law 101-549 Clean Air Act - Title VI Stratospheric Ozone and Global Climate Protection
 - October 24, 1992 - Public Law 102-486 Energy Policy Act of 1992
- President Clinton Administration 1/20/1993 - 1/20/2001
 - November 18, 1997 - Public Law 105-85 National Defense Authorization Act for Fiscal Year 1998
- President W. Bush Administration 1/20/2001 - 1/20/2009
 - July 31, 2001 - Executive Order 13221 Energy-Efficient Standby Power Devices
 - May 13, 2002 - Public Law 107-171 Farm Security and Rural Investment Act of 2002

- May 12, 2003 - Department of Defense Directive 5000.01 The Defense Acquisition System
- August 8, 2005 - Public Law 109-58 Energy Policy Act of 2005
- January 24, 2007 - Executive Order 13423 Strengthening Federal Environmental, Energy, and Transportation Management
- December 19, 2007 - Public Law 110-140 Energy Independence and Security Act of 2007
- President Obama Administration, 1/20/2009 - 1/20/2017
 - March 11, 2009 - Public Law 111-8 Omnibus Appropriations Act, 2009
 - October 5, 2009 - Executive Order 13514 Federal Leadership in Environmental, Energy, and Economic Performance
 - January 7, 2015 - Department of Defense Instruction 5000.02 Operation of the Defense Acquisition System
 - March 19, 2015 - Executive Order 13693 Planning for Federal Sustainability in the Next Decade
 - June 10, 2015 - Implementing Instructions for Executive Order 13693 Planning for Federal Sustainability in the Next Decade
 - September 7, 2016 - The Department of Defense Strategic Sustainability Performance Plan
- President Trump Administration, 1/20/2017 - 1/20/2021
 - March 3, 2017 - Defense Acquisition Guidebook
 - July 1, 2018 - Code of Federal Regulations, Title 40, Part 82 - Protection of Environment, Protection of Stratospheric Ozone

- August 22, 2018 - Code of Federal Regulations, Title 48, Part 23, Federal Acquisition Circular Number: 2005-100 -Federal Acquisition Regulation, Environment, Energy and Water Efficiency, Renewable Energy Technologies, Occupational Safety, and Drug-Free Workplace
- August 31, 2018 - Department of Defense Instruction 4105.72 Procurement of Sustainable Goods and Services

Appendix B. Approvals, Invitations, and Consents

Date 11/21/2023

Principal Investigator: Henry St. Maurice
Co-Principal Investigator: Robert Boesen
Protocol Number: 2023-71
Protocol Title: Sustainable procurement behavior among contracting officers
Protocol Approval Date: 11/21/2023
Protocol Expiration Date: 11/20/2028
Review Category: 2
UWSP FWA: 00017591

Dear Henry,

The above-referenced human-subjects research project has been approved by the University of Wisconsin-Stevens Point Institutional Review Board (IRB) Committee. This approval is limited to the activities described in the approved protocol, and extends to the performance of these activities at each applicable site identified in the application for IRB review. In accordance with this approval, the specific conditions for the conduct of this research are listed below, and informed consent from subjects must be obtained as indicated. Additional conditions for the general conduct of human-subjects research may be detailed below.

Additional Conditions:

All individuals engaged in human-subjects research are responsible for compliance with all applicable UWSP Research Policies. The Principal Investigator is responsible for assuring all protocol personnel review and adhere to applicable policies for the conduct of human-subjects research.

The IRB maintains an official protocol file for each study to meet the University's regulatory obligations for record keeping. Principal Investigators are responsible for maintaining all records related to the protocol, and are required to share with the IRB. The IRB is not responsible for maintaining study documents for researchers.


Your project approval expiration date is listed above. Exempt protocols have an automatic 5-year approval period. As a courtesy to you, and to reduce administrative burden, the IRB will request an annual update from the Principal Investigator on the status of this study. It is your responsibility to inform the IRB if the project is complete or still in operation. If the study needs to remain open after year 5, you must submit a new protocol. Lapses in approval should be avoided to protect the safety and welfare of enrolled subjects. When you plan to close your study, submit a Protocol Closure Form to irb@uwsp.edu.

No changes are to be made to the approved protocol or study documents (i.e., consent forms, surveys, etc....) without prior review and approval of the IRB. To modify an existing protocol, complete the Protocol Modification Form and submit to irb@uwsp.edu.

If there are any injuries, problems, or complaints from participants, you must notify the IRB at irb@uwsp.edu within 24 hours.

If you have any questions, please contact me. Good luck with your project.

Sincerely,



David Barry, Ph.D.
IRB Chair
dbarry@uwsp.edu

Good Morning Robert,

Thank you for your inquiry. After confirming with my director, the best place to post a survey of this kind would be on our member only forum Collaborate. We wish you all the best in your research. Please let us know if you have any questions or if there is anything else we can do to be of assistance.

All the best,

Jody Leon, NCMA Learning Specialist
National Contract Management Association
1818 Library Street, Suite 500
Reston, Virginia 20190

Subject: Invitation to Participate: Sustainable Procurement Survey

Dear Department of Defense Contracting Officer,

Sustainable procurement, especially within the context of environmental considerations, has become an integral priority for the Department of Defense. In partnership with the University of Wisconsin Stevens Point, I am conducting a study to understand the experiences and motivations of DoD Contracting Officers regarding sustainable procurement.

Specifically, we aim to delve into your experiences with the acquisition of goods and services that meet ecological criteria. For the purpose of this study, we will solely concentrate on the environmental aspects of sustainable procurement, excluding the social facets or considerations of social return.

Your invaluable input through this questionnaire will significantly enrich my graduation research. The insights gathered will serve as a foundation to refine sustainable procurement processes and more effectively synchronize them with prevalent acquisition practices. Please rest assured that your participation will remain strictly anonymous. The questionnaire should take approximately fifteen minutes, and the compiled data will only be accessible to researchers at UWSP, ensuring that individual respondent identities remain confidential.

Very Respectfully,

Robert A. Boesen

Dissertator

University of Wisconsin Stevens Point

Informed Consent to Participate in Human Subjects Research

Dr. Henry St. Maurice and Mr. Robert Boesen, an education professor and student at the University of Wisconsin-Stevens Point, would welcome your participation in a research study examining sustainable procurement behavior among Department of Defense (DoD) Contracting Officers (KO). You are requested to complete an anonymous survey that should take no longer than fifteen minutes. Participation is entirely voluntary. This intent of the study is to provide a clearer understanding of sustainable acquisitions in the United States.

We anticipate no risk to you because of your involvement in this study beyond the inconvenience of the time required to complete the survey.

While there may be no immediate benefit to you due to your involvement in this study, it is hoped that we may gain valuable information regarding DoD KO's sustainable procurement behavior that will be of future value to sustainability in acquisitions.

This information may be gathered by conducting an interview with you, but the survey is the quickest and most convenient way to obtain it. Alternatively, you may choose to opt out of participation.

The responses you provide on the questionnaire will be recorded anonymously to protect your privacy. Identifiable information that could link you to your responses will not be released. All collected data will be securely stored on a password-protected computer accessible only to the research team led by Dr. Henry St. Maurice. Physical copies of the data, if any, will be securely stored in a locked file cabinet in Mr. Robert Boesen's office and will only be accessible to individuals directly involved in this research study.

Your participation in this study is entirely voluntary. If you want to withdraw from the study at any time, you may do so without penalty or loss of benefit entitled. Only anonymous information provided will be retained. All identifiable information will be removed from the study and destroyed or deleted.

Once the study is completed, you may receive the results of the study. If you would like these results, or if you have any questions in the meantime, please contact:

Dr. Henry St. Maurice or Mr. Robert Boesen
School of Education, University of Wisconsin – Stevens Point
Stevens Point, WI 54481
hstmauri@uwsp.edu or rboes203@uwsp.edu

If you have any complaints about your treatment as a participant in this study or believe that you have been harmed in some way by your participation, please call or write:

David Barry, PhD

IRB Chair

Associate Professor, Sociology

2100 Main St.

Old Main 208

University of Wisconsin, Stevens Point and Extension

Stevens Point, WI 54481

715.346.3799

irb@uwsp.edu

Although Dr. Barry will ask for your name, all complaints are confidential.

"I have read and understand the information provided; my participation is voluntary, and I may withdraw at any time."

Appendix C. Instrument

Are you a Warranted Contracting Officer?

- Yes/No

Do you work for the Department of Defense?

- Yes/No

The questionnaire starts with some general questions you.

1. What is your gender?
 - a. Male
 - b. Female
 - c. Other
 - d. Prefer not to answer
2. What is your year of birth?
 - a. List of years
3. What is the highest level of education completed?
 - a. High school graduate or GED
 - b. Some college, no degree
 - c. Associate's degree (e.g., AA, AS)
 - d. Bachelor's degree (e.g., BA, BS)
 - e. Postgraduate certificate
 - f. Master's degree (e.g., MA, MS, MBA)
 - g. Professional degree (e.g., JD, MD, DVM)
 - h. Doctorate degree (e.g., PhD, EdD)

Affective commitment to change.

The implementation of sustainable procurement

1. I see it as my duty to go along with the implementation of sustainable purchase.
2. The implementation of sustainable procurement serves an important purpose.
3. I would feel guilty if I opposed the implementation of sustainable procurement.

4. I have no choice but to go along with the implementation of sustainable purchase.
5. The implementation of sustainable procurement is not necessary.
6. I don't think I'm doing a good job of opposing the implementation of sustainable buy to be.
7. I do not feel any obligation to implement sustainable procurement to support.
8. I think management makes a mistake with the implementation of sustainable procurement.
9. It would be irresponsible of me to oppose the implementation of sustainable purchasing.
10. The implementation of sustainable procurement does not make things any better.
11. I feel compelled to go along with the implementation of sustainable purchase.
12. I believe in the value of implementing sustainable procurement.
13. Opposing the implementation of sustainable procurement costs, me too much.
14. The implementation of sustainable procurement is a good strategy for the organization where I work.
15. Speaking out against the implementation of sustainable procurement brings risks with him.
16. I would feel bad if I spoke out against the implementation of sustainable procurement.
17. It is not a realistic option for me to resist the implementation of sustainable procurement.
18. There is too much at stake for me to resist the implementation of sustainable procurement.

Connection of sustainable procurement

1. The implementation of sustainable procurement is part of an overarching strategy within the organization where I work.
2. The implementation of sustainable procurement is in line with other things that happen within the organization where I work.
3. I understand how the implementation of sustainable procurement fits within the strategic vision of the organization where I work.

Procedures

1. Have you been able to express your views and feelings regarding these procedures?
2. Have you had an influence on the implementation of sustainable procurement through these procedures?
3. Were these procedures applied consistently?
4. Were these procedures' objective?
5. Were these procedures based on correct information?

6. Have you had the opportunity to appeal against the procedures that were used to implement sustainable procurement?
7. Do these procedures correspond to generally applicable standards, and values?

Sustainability and the environment

1. For me, acting in an environmentally friendly manner requires too much time and effort.
2. Scientists will likely find a solution to global warming that won't require people to significantly change their lifestyles.
3. Compared to other priorities in my life, the environment ranks low.
4. I am environmentally conscious in most of my actions.
5. Most people in the United States need to change their lifestyles to ensure a good quality of life and environment for future generations.
6. I personally need to change my lifestyle to ensure that future generations can enjoy a good quality of life and environment.
7. How often do you consider the need to reduce CO2 emissions in your daily activities? For example, do you often drive less or make an effort to turn off lights when possible?

Sustainable Public Procurement Behavior

1. Did other people around you generally paint a positive picture of sustainable procurement?
2. Have you ever defended sustainable procurement when others criticized it?
3. Do you find yourself speaking positively about sustainable procurement?
4. Have you ever made any suggestions to improve the effectiveness of sustainable procurement?
5. Have you demonstrated commitment to initiatives aimed at improving the effectiveness of sustainable purchases?
6. Have you ever thought of ways to make the process of sustainable purchasing more efficient?
7. Have you looked up additional information about sustainable procurement or sustainability in general?
8. Have you ever sought internal or external advice on your own initiative to improve sustainable procurement or sustainability practices?
9. Have you made any suggestions to make a specific procurement project more sustainable?

10. Have you challenged suppliers to develop the most sustainable solution possible, whether this was discussed in a formal dialogue?