



Impact of demographic characteristics of procurement professionals on sustainable procurement practices: Evidence from Australia



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ABSTRACT

The purpose of this study is to explore the impact of the demographic characteristics of procurement professionals on sustainable procurement (SP) practices inside Australian universities. The study addresses the “who” question—that is, who inside an organisation might be the most likely to engage in SP practices. Using a valuable sample of 224 procurement professionals, the findings of this study provide evidence that demographic characteristics such as working tenure, qualification and position predict SP practices, particularly in the areas of environment, philanthropy and safety. The study implies that if there are more qualified female procurement professionals, it is likely that an organisation will pursue environmentally friendly procurement activities. This is the first study to confirm the effect of the demographic characteristics of procurement professionals on SP dimensions, which to date has been completely undisclosed in the literature. It adds another dimension to understanding SP in the workplace.

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1. Introduction

The United Nations Environment Programme (UNEP) (2015) defines sustainable procurement (SP) as “a process whereby organisations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy, whilst minimising damage to the environment”. In 1992, the United Nations (UN) Earth Summit meeting in Rio de Janeiro recognised the need for sustainable procurement features, as reflected in the following excerpt from the Earth Summit publication.

The major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialised countries, which is a matter of grave concern, aggravating poverty and imbalances (United Nations Sustainable Development, 1992).

Walker et al. (2012, p. 203) state that research potential exists in further understanding SP, such as “understanding how individual values influence sustainability” and “the factors affecting the extent to which organisations engage in sustainable

procurement”. In response, the current study investigates whether the demographic characteristics of procurement professionals have any impact on SP practices and how procurement professionals differ in their SP decision making.

Understanding the demographic characteristics of procurement professionals and their impact on SP practices is primarily important for two reasons. First, the demographic characteristics of procurement professionals may potentially leverage an important insight into understanding just who inside an organisation is inclined towards SP practices and which demographic characteristics are key in this regard. Second, there is thus far no reliable evidence showing that internal drivers, such as the behavioural attributes, personality traits and socio-demographic characteristics of purchasing and supply professionals, influence the accomplishment of sound SP practices.

This study acknowledges that several other factors (both internal and external), such as organisational procurement policy and budget and sustainability guidelines, play an important role in SP implementation. This study does not intend to distinguish various SP practices undertaken by procurement professionals, but rather focuses on the demographic characteristics of procurement professionals and their impact on SP practices. Zsidisin and Siferd (2001) emphasise that purchasing personnel have a strong capacity to influence price, material purchased, quality and delivery, equipment selection, use of energy, emissions, investment recovery and other facets of production and delivery. Since they are responsible for strategic buying and purchasing, negotiating and

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contracting, cost reduction and building strategic relationships, it is worthwhile investigating whether the demographic characteristics of procurement professionals have any impact on their SP practices.

Australian universities make a rich study context because the majority of the universities there are publicly owned, and received \$14 billion funding from the government in 2014 for improving infrastructure support and the quality of education (Department of Education, 2014). It is important to explore the SP practices inside Australian universities primarily for three main reasons. First, Australian universities spend a huge amount of money on procurement activities. Although the specific amount spent on procurement activities is publicly unavailable, the Department of Education's website does state that Australian universities have assets of more than \$35 billion in property, plant and equipment. A few Australian universities disclose the procurement process inside the university, which provides an idea about the amount involved in procurement activities. For example, the Monash University website states that there are several procurement and purchasing activities across the university, starting from simple (day-to-day) purchases involving AUD \$20,000 to strategic procurement involving complex purchases of around AUD \$1,000,000 (Strategic Procurement Procedures, 2012). Thus, it is assumed that a large amount of public money is spent on procurement practices inside Australian universities.

Second, most of the SP studies have only been carried out from an organisational perspective (Carter et al., 1998; Schaper, 2002; Carter and Jennings, 2004; Lau, 2011; Brammer and Walker, 2011; Walker and Brammer, 2009, 2012; Liu et al., 2012), and there are only a few SP studies (such as Meehan and Bryde, 2011; Li and Geiser, 2005) conducted within the non-industrial sectors. Most of the purchasing and supply literature has not examined the SP practices inside the education and non-market sectors. Gruen (2012, p. 11) states that the non-market sector in Australia (including education and training) "makes up roughly 26 per cent of employment and 18 per cent of output and a significant proportion of these services are provided by government". Li and Geiser (2005) find that universities conduct huge purchasing and contracting activities, and there are significant degrees of variation in the purchasing approach across the universities. There is a lack of SP studies in the education sector, particularly in Australia that "employs over 107,000 people and in 2009 had close to \$19.9 billion in total revenue" (TEQSA, 2014). Third, another important reason to conduct this study is that the Australian government spends approximately 7.1% of GDP on education (Australian Bureau of Statistics, 2012) and the majority of Australian universities are public universities funded by the government, and thus have a strong potential to influence SP practices. The above three reasons emphasise the importance of exploring the SP practices inside Australian universities that generate significant revenue and employment. The study argues that a deeper understanding of the demographic characteristics of procurement professionals inside Australian universities is needed to bridge the gap in the literature.

Gruen (2012, p. 7) further states that non-market sectors in Australia such as health care, social assistance and education and training "have a significant direct impact on productivity because they are primarily or significantly responsible for governance and service delivery".

Realising the breadth of procurement practices inside Australian universities, this current study explores the demographic characteristics of procurement professionals, an important area hitherto overlooked. The study examines the procurement professionals who are purchasing in a more sustainable way—and in particular looks at their key demographic characteristics. Such attention will help understand the procurement function, and will also identify just who in an organisation may be likely to purchase

in a more sustainable manner.

The remainder of this paper is structured as follows. Section 2 outlines a review of the literature, detailing the demographic characteristics that are being measured. Section 3 presents the research methodology of this study. Section 4 presents analysis and results, followed by a discussion and interpretation in Section 5. Section 6 provides concluding remarks, including implications for future research.

2. Literature review and theory building

There is a body of literature which suggests that procurement-specific skills (such as technical skills, behavioural skills, generic skills, broad financial skills) of procurement professionals contribute to organisational performance (Cousins et al., 2006; Giunipero et al., 2006; Large and Gimenez, 2006; Tassabehji and Moorhouse, 2008). However, according to our investigation, the literature fails to recognise the direct impact of the demographic characteristics of procurement professionals on actual procurement practices. As a result, there is an understanding of the skills, but not of just who these professionals are. The literature suggests that, from the consumer perspective, studies have addressed individual values, personal attitude, ethnicity, normative pressure and cognitive bases, including functional background and educational qualification, and their influence on environmentally friendly purchasing (Becker et al., 1981; Stern et al., 1993; Kempton et al., 1995; Schlegelmilch et al., 1996; Diamantopoulos et al., 2003; Johnson et al., 2004; Poortinga et al., 2004; Han et al., 2011; Fisher et al., 2012). Thus, the literature provides a strong indication that demographic characteristics, social and individual values and personal attitudes have the potential to influence individuals in their decision making regarding the purchase of goods and services. So far, however, there has been little discussion about the demographic characteristics of procurement professionals, as the majority of the demographic studies are conducted from the individual consumer's viewpoint, which may or may not differ from that of a corporate consumer. Because procurement professionals are also individuals, it is expected that their age, gender, working tenure, knowledge and education have the potential to influence their purchasing behaviour.

This study acknowledges that personal and organisational purchasing behaviours are not similar, as they do have a different purpose, but the role of demographic characteristics in organisational purchasing behaviours is worth exploring in light of some of the debate in the literature. For example, Sebastian and Davison (2011) recognise the demographic characteristics of procurement professionals, including other personal factors such as beliefs and values, in understanding contract administrative problems. However, counter to that, Hall (2012) finds that the demographic characteristics of marketing officers have little or no impact on marketing index scores. With there being no clear indication whether demographic indices affect organisational purchasing processes, the current study builds upon the literature (Diamantopoulos et al., 2003; Johnson et al., 2004; Poortinga et al., 2004; Han et al., 2011; Fisher et al., 2012) and extends it by focusing on the demographic characteristics of procurement professionals.

A recent US study by Wagner and Kemmerling (2014, p. 164) finds that the "long-term trend for a stronger chief supply chain officers' (CSCO) presence in top management teams (TMTs) leads to a gradual increase in supply chain expertise in US corporate upper echelons". Their study also finds a link between operating profit margin and supply chain management experience in top management teams. Supporting the demographic characteristics and their organisational influence, Manner (2010) finds that the

demographic characteristics of CEOs have a considerable impact on a firm's corporate social performance. Overall, demographic characteristics act as a determinant in deciding organisational objectives.

The age variable is explored in relation to sustainable buying and eco-friendly intentions (Anderson and Cunningham, 1972; Samdahl and Robertson, 1989). According to Carlsson and Karlsson (1970, p. 717), "each age-level reacts to the environmental forces called "stimulus pressure" by changing in the aggregate, but younger people change faster than older people". Chan (1996) finds that age is a strong indicator of environmentally friendly purchasing, and that young respondents are more likely to engage in eco-friendly purchasing. Based on the above-mentioned discussion, the following hypothesis is presented:

H1. There is a difference between young and mature procurement professionals in their SP practices.

The gender differences between men and women in the workplace have inconsistent findings. There are studies which state that women exhibit more proactive environmental behaviours and are more environmentally conscious and aware (Webster, 1975; Straughan and Roberts, 1999; Olli et al., 2001). Multidisciplinary research has come to the conclusion that there are gender differences in purchasing behaviour and socially conscious behaviour (Homburg and Giering, 2001), and in some studies the female sample is more inclined to adopt green purchase practices (Mainieri et al., 1997; Liu et al., 2012). Williams (2003) finds that having female directors on boards is positively associated with firms' corporate philanthropic practices. In a similar vein, Stephenson (2004) finds that female board directors are different from their male colleagues and foster greater social and community responsibility and innovation. A study conducted by Schaper (2002), however, states that the gender of managers/owners across small and medium-sized enterprises has no significant relationship with environmental performance in Australia. Contrary to this, Boulouta (2013) confirms that board gender diversity positively affects corporate social performance. Therefore, and recognising this is a debated issue, the study proposes the following hypothesis:

H2. There is a difference between female and male procurement professionals in their SP practices.

Hambrick and Mason (1984) argue that educational background is a useful indication of knowledge and skill base. Meta-analysis conducted by Hines et al. (1987) notes that there is a difference between highly educated and less educated individuals in their environmentally friendly behaviour, unlike Olli et al. (2001), who do not find any such significant differences between highly educated and less educated individuals. Granzin and Olsen (1991) confirm that education and environmental concerns share a positive relationship, unlike Schaper's (2002) study which finds that the education of managers is not a predictor of environmental performance. Similarly, there is a difference between the purchasing behaviour of respondents with a trade qualification and those with a university/college qualification (Chan, 1996). Therefore, building upon the literature, this study hypothesises the following:

H3. There is a difference between highly educated and less educated procurement professionals in their SP practices.

The procurement professionals in this study are categorised into three different levels: top-level professionals include procurement directors or procurement executives or their equivalents who are in charge of the organisation in establishing and governing procurement strategies; middle management includes procurement managers and/or procurement officers and their

equivalents who execute procurement duties; and first-level professionals include procurement administrative staff/procurement assistants. In line with Carter et al. (1998), this classification will enable a better understanding of whether there are differences in SP practices among the three levels. A pre-test provided evidence that several buying and purchasing activities (approximately \$10,000 AUD annually) are conducted at the school/department level. This purchasing includes printer inks, photocopy paper, furniture items like desks, reading lamps, chairs, notepads, pen sets, blackboard markers, packaging materials, sticky notes and stationery sets. This purchasing is often done by a school manager, school administrator, department coordinator or administrative assistant (or someone else in a purchasing role, possibly designated differently in each university). In this study, they are referred to as "procurement administrators" and they conduct purchasing activities within the school/department level. For example, the commerce division of an Australian university, on an average, has eight departments/schools (e.g. accounting, finance, management, marketing, economics, tourism and hospitality, information science, law and entrepreneurship) and approximately eight different procurement administrators conduct the annual purchasing within the commerce division. Similar buying and purchasing activities are conducted in the other divisions, departments and schools for each university. Overall, this amounts to considerable purchasing and involves procurement activities, and so is important to consider here.

Therefore, the procurement administrators (who conduct selecting, purchasing and similar acquisition activities at the school/department level and are not involved in any other strategic procurement roles like developing procurement policies and objectives) are also taken into account because, as mentioned above, procurement administrators conduct a fairly large amount of purchasing activities. Thus, it is considered legitimate to explore their demographic characteristics and its impact on SP practices.

Carter et al. (1998) investigate company-specific factors, such as top- and middle-management support, departmental goals and training and evaluation, for their respective impacts on environmental purchasing. Their study compares US purchasing managers with German purchasing managers and finds that middle-level purchasing managers have the capacity to facilitate environmentally friendly purchasing activities. They state that "middle level purchasing managers can, at a minimum, orchestrate the adjustments necessary to facilitate incremental adaption of environmental purchasing activities" (p. 34). Building upon the literature, this study assumes that top-tier procurement professionals carry responsibilities and accountabilities for designing and implementing procurement policies at the organisational level. Therefore, this means top-tier procurement professionals will be more concerned about environmentally friendly procurement practices compared with middle- and entry-level procurement professionals. This leads to the following hypothesis:

H4. Top-level procurement professionals are positively associated with SP practices.

The length of the working tenure of procurement professionals can be seen as a measurement of their awareness or knowledge of SP practices, primarily green purchasing and environmentally friendly activities. In this study, working tenure is defined as the total number of years worked as a procurement or procurement-related professional. Pfeffer and Salancik (1977) find that long-standing individuals are positively associated with an organisation's rapport with local trade and business communities. Fredrickson (1985) provides evidence that, with experience, there is a difference in strategic decision making between upper-middle executives and trainee MBA students.

Thomas and Simerly (1994) empirically examine the relationship between managerial characteristics (such as experience, tenure and functional background) and corporate social performance in a sample of 350 corporations in the US. Their findings support the upper echelons theory's argument that organisations are reflections of their top managers. They show that CEOs having longer tenure in a company are associated with high corporate social performance as compared with their counterparts having shorter tenure. Similarly, Manner (2010) provides tentative support for the argument of a positive relationship between executive position tenure and corporate social performance. Following the existing literature, the following hypothesis is presented:

H5. Procurement professionals with long working tenures are positively associated with SP practices.

3. Research methodology

3.1. Data collection¹

The population frame for this study is procurement professionals or their equivalents who participate in diverse procurement actions, decisions and activities, such as planning, negotiating, purchasing, contracting, selecting and similar acquisition activities within 39 Australian universities. For this reason, procurement professionals are considered a relevant target population for exploring the impact of demographic characteristics on SP practices. Australia has a total of 39 universities (as on July 2011); 37 are public institutions and two private (one Catholic, one secular). The procurement functions undertaken by procurement professionals (as cited on the university websites) inside universities are ordering services and goods for the university campus, tender evaluation, vendor selection, fulfilling university purchasing needs, building works and projects, maintaining contracts and agreements, complying with occupational health and safety requirements for building works and services, dealing and negotiating with suppliers and contractors and submitting expenditure statements. A list of 503 procurement professionals was systematically achieved by manually developing a database (the name, designation and contact details of the procurement professionals or their equivalents) from the 39 Australian university websites. A total of 503 surveys via post (with a prepaid return envelope) were sent to the procurement professionals across 39 Australian universities from June 2011 to September 2011. A total of 224 (approximately 45% return rate) usable surveys were returned and considered to be valid for this research. The ethics approval for this study was received.

3.2. SP measurement

This study uses the scale developed by Carter and Jennings (2004)—the Purchasing Social Responsibility Scale—which has an internal consistency=.85 and is widely accepted within the procurement literature (Walker and Brammer, 2009; Brammer and Walker, 2011; Lau, 2011).

According to Carter and Jennings (2004), environment (SP1), diversity (SP2), human rights (SP3), philanthropy (SP4) and safety (SP5) (dependent variables) holistically measure socially responsible purchasing activities in an organisation. "SP is a multifaceted phenomenon encompassing a wide range of issues, and the five dimensions of SP practices are higher-order construct" (Brammer and Walker, 2011, p. 461). Carter and Jennings (2004)

Table 1
SP dimensions.

| Dimensions | Currently, our purchasing function |
|----------------------|---|
| 1 Environment (SP1) | <ul style="list-style-type: none"> ■ Uses a life-cycle analysis to evaluate the environmental friendliness of products and packaging ■ Participates in the design of products for disassembly ■ Asks suppliers to commit waste reduction goals ■ Participates in the design of the products for recycling or reuse ■ Reduces packaging material ■ Purchases recycled packaging ■ Purchases recycled items that are of lighter weight |
| 2 Diversity (SP2) | <ul style="list-style-type: none"> ■ Purchases from minority-/women-owned business enterprise (MWBE) suppliers ■ Has a formal MWBE supplier purchase program |
| 3 Human rights (SP3) | <ul style="list-style-type: none"> ■ Visits suppliers' plants to ensure that they are not using sweatshop labour ■ Ensures that suppliers comply with child labour laws ■ Asks suppliers to pay a "living wage" greater than a country's or region's minimum wage |
| 4 Philanthropy (SP4) | <ul style="list-style-type: none"> ■ Volunteers at local charities ■ Donates to philanthropic organisations ■ Helps to increase the performance of suppliers in the local community |
| 5 Safety (SP5) | <ul style="list-style-type: none"> ■ Ensures that suppliers' locations are operated in a safe manner ■ Ensures the safe incoming movement of product to their facilities |

state that the five dimensions are the drivers of corporate social responsibility for purchasing and can be called purchasing social responsibility (PSR). They further provide evidence that "activities surrounding the areas of diversity, the environment, safety, human rights, and philanthropy in purchasing management, have been studied separately in the past, are in fact related and fall under the rubric of PSR" (p. 167). These practices are not merely a perception, but the drivers of SP. The purchasing managers or professionals (procurement professionals) should broadly undertake these five activities (see Table 1 for description) to accomplish socially responsible purchasing. Carter and Jennings (2004) state that there are other drivers of socially responsible purchasing (such as organisational culture and top management leadership, employee initiatives and values); however, this study focuses on the five core dimensions of SP. Carter and Jennings (2004) also state that the dimensions of PSR should be holistically studied. Table 1 presents the PSR dimensions in detail.

The Cronbach's alpha value for the scale in this study is .935, thus confirming that the scale is highly reliable. This scale is used in this study to identify the SP activities that might be carried out by SP professionals. This helps identify "what" is being done, and "who" (demographic characteristics) inside the organisation is carrying out SP activities. Understanding this will help to comprehend the procurement function *per se*, and reveal who in an organisation may be empowered to purchase in a more sustainable manner.

3.3. Sample

Table 2 presents a demographic summary of the study sample. Of the 224 respondents, 95 were men and 129 were women. The majority of these respondents were in the age group 51–60 (39%). Among the respondents, 46% had a bachelor's degree and 28.6%

¹ Data used in this study are taken from the Ph.D. thesis of one of the authors.

Table 2
Sample characteristics.

| Demographic characteristics | Frequency | Percentage of sample | Minimum | Maximum | Mean | Median | Std. deviation |
|--|-----------|----------------------|---------|---------|------|--------|----------------|
| Age | | | | | | | |
| Under 35 | 35 | 15.1 | | | | | |
| 36–50 | 65 | 29.8 | 1 | 4 | 2.56 | 3 | .94 |
| 51–60 | 88 | 39 | | | | | |
| 61–above | 36 | 16.1 | | | | | |
| Gender | | | | | | | |
| Male | 95 | 42.6 | 0 | 1 | .58 | 1 | .495 |
| Female | 129 | 57.4 | | | | | |
| Position/title | | | | | | | |
| Procurement administrators (first level) | 35 | 12.2 | | | | | |
| Procurement managers (middle staff) | 144 | 66.8 | 1 | 3 | 2.01 | 2 | .646 |
| Procurement Directors (top level) | 45 | 20.9 | | | | | |
| Working tenure | | | | | | | |
| Less than 5 years | 53 | 23.7 | | | | | |
| 5–8 years | 70 | 31.3 | 1 | 4 | 2.5 | 2 | 1.113 |
| 9–12 years | 48 | 21.4 | | | | | |
| 13 and above | 53 | 23.7 | | | | | |
| Qualification | | | | | | | |
| Trade | 57 | 25.4 | | | | | |
| Bachelor's | 103 | 46 | 1 | 3 | 2.03 | 2 | .736 |
| Master's and above | 64 | 28.6 | | | | | |

Table 3
List of variables used in this study.

| Independent variable ^a | Explanation |
|-----------------------------------|--|
| Age | Age of procurement professionals, coding 1=under 35, 2=36–50, 3=51–60, 4=61 and above |
| Gender | Gender of procurement professionals, coding 0=male, 1=female |
| Position | Position/role of procurement professionals in the organisation, coding 1=first level management, 2=middle management, 3=top management |
| Tenure | Total number of years in procurement role, coding: 1=< 5 years, 2=5–8 years, 3=9–12 years, 4=13 and above |
| Qualification | Qualification of procurement professionals, coding: 1=trade qualification, 2=bachelor's degree, 3=master's and doctoral degree |

^a The authors understand that having some control variables would have made these results more robust. But the quantitative analysis in this study is based on primary data collected by sending questionnaires to procurement professionals working in Australian universities. To secure the anonymity of the participants, the authors did not include questions such as the name of the university or department where these professionals work. Therefore, the authors do not have access to the potential control variables such as size and revenue of these universities. This data limitation has been recognised in the limitations. However, sector/industry is constant.

had a master's and doctoral qualification. The majority of the respondents surveyed were working at the middle-management level (66.8%), and most of them had been holding the procurement position for more than five years (76.4%). Table 2 provides descriptive statistics.

For hypothesis testing, in addition to a series of ANOVA tests, the authors ran a series of multiple regression analyses by estimating the following regression model:

$$Y = \alpha + \beta_1(\text{Age}) + \beta_2(\text{Gender}) + \beta_3(\text{Position}) + \beta_4(\text{Tenure}) + \beta_5(\text{Qualification}) + \varepsilon$$

3.4. Dependent variable

The five dimensions of SP practices—environment (SP1), diversity (SP2), human rights (SP3), philanthropy (SP4) and safety (SP5)—are dependent variables in this study. From this point, for convenience, the study uses the symbols SP1, SP2, SP3, SP4 and SP5 for the five dependent variables.

3.5. Independent variables

The demographic characteristics of procurement professionals are taken as independent variables for the purpose of this study. Table 3 shows a list of these independent variables and their coding.

4. Analysis and results

As discussed above, for hypothesis testing, the study first conducted a series of ANOVA tests and correlation analysis followed by multiple regression analyses (Tables 4–7). Although a total of five one-way ANOVA tests were conducted by using SPSS, in this paper only significant results are reported. Hypothesis 1 predicted that there is a difference between young and mature procurement professionals in their SP practices. Both ANOVA tests and

regression analyses² (results not shown) do not provide any evidence of a significant difference between young and mature procurement professionals in their SP practices. Furthermore, there is no confirmation of a link between the age of procurement professionals and the dimensions of SP practices. Therefore, **Hypothesis 1** is rejected.

The ANOVA tests (**Table 4**) reveal significant differences in SP1 (environment) across gender groups ($F=5.253$, $p=.023$). Further, descriptive statistics show that mean scores for SP1 are higher for the female group compared with the male group: $M_{\text{female}}=4.115$, $M_{\text{male}}=3.857$. This test partially supports **Hypothesis 2**, which predicted that there is a difference between female procurement professionals and male procurement professionals in their SP practices. But the results indicate that female procurement professionals are positively associated with only one dimension of SP practices, namely, environment. Regression analysis also reveals that female procurement professionals are positively associated ($\beta=.165$, $p=.015$) with environmentally friendly SP practices. Both ANOVA and regression analysis do not suggest any possible link of female procurement professionals with other dimensions, such as diversity, human rights, philanthropy and safety. Thus, **Hypothesis 2** is only partially supported by both ANOVA and regression analysis.

Hypothesis 3 predicted that there is a difference between highly educated procurement professionals and less educated procurement professionals in their SP practices. To test this hypothesis, the study tested whether procurement professionals having a bachelor's, master's or higher qualifications are more frequently associated with the five dimensions of SP practices, relative to those having a trade qualification. The ANOVA results (**Table 6**) reveal significant differences in four out of five dimensions of SP practices: SP1 ($F=2.385$, $p=.036$), SP2 ($F=3.861$, $p=.022$), SP4 ($F=5.965$, $p=.003$) and SP5 ($F=6.182$, $p=.002$). Further, descriptive statistics show that mean scores in SP1 ($M_{\text{mean}}=4.109$), SP3 ($M_{\text{mean}}=3.420$) {10% significance level}, SP4 ($M_{\text{mean}}=4.344$) and SP5 ($M_{\text{mean}}=4.430$) for groups of professionals having a master's degree and above are significantly higher than the other qualification groups. Descriptive statistics further show that mean scores in SP2 ($M_{\text{mean}}=2.806$) for qualification groups having a bachelor's degree are significantly higher than the other qualification groups. Thus, the ANOVA tests partially support this hypothesis and confirm that there is a difference between highly educated procurement professionals and less educated procurement professionals. Similar to the ANOVA tests' findings, regression analyses also reveal that procurement professionals having master's and doctoral qualifications are significantly positively associated with SP1 (environment) ($\beta=.211$, $p=.014$), SP4 (philanthropy) ($\beta=.187$, $p=.033$) and SP5 (safety) ($\beta=0=.261$, $p=.003$) compared with other groups of qualification, thus confirming that procurement professionals having master's and doctoral qualifications are more concerned about the environment, philanthropic activities (such as charity and donations) and safety issues in dealing with procurement practices.

Hypothesis 4 predicted that the top-level procurement professionals would be positively associated with all dimensions of the SP practices. But the ANOVA tests did not suggest statistically significant differences in SP practices across different position groups; the comparison of mean scores in descriptive statistics

Table 4
Results of ANOVA: gender differences in SP dimensions.

| Dependent variable | Gender | Total number | Mean | Standard deviation | F | Sig. |
|--------------------|--------|--------------|-------|--------------------|-------|--------------|
| SP1 | Male | 95 | 3.857 | .943 | 5.253 | .023* |
| | Female | 129 | 4.115 | .710 | | |
| SP2 | Male | 95 | 2.582 | .750 | 2.023 | .156 |
| | Female | 129 | 2.726 | .728 | | |
| SP3 | Male | 95 | 3.170 | 1.049 | .207 | .650 |
| | Female | 129 | 3.231 | .913 | | |
| SP4 | Male | 95 | 4.232 | .945 | .947 | .332 |
| | Female | 129 | 4.349 | .825 | | |
| SP5 | Male | 95 | 4.158 | .961 | 1.243 | .266 |
| | Female | 129 | 4.286 | .736 | | |

* $p < .05$.

provides an indication that first-level managers are more inclined towards SP practices compared with middle- and top-level managers. This inclination is partially supported further by regression analyses which reveal that top-level managers/procurement directors are negatively associated with the environment ($\beta=-.220$, $p=.013$), suggesting that top-level procurement professionals are less associated with environment-related SP practices compared with first-level and middle-level procurement managers. Thus, this hypothesis is not supported.

Hypothesis 5 predicted that executives having a longer working tenure would be positively associated with all dimensions of SP practices. ANOVA tests (**Table 5**) reveal significant differences in three out of five SP practices: (SP1 ($F=8.224$, $p=.000$), SP2 ($F=2.518$, $p=.059$)) {10% significance level}, (SP4($F=6.930$, $p=.000$) and SP5 ($F=4.661$, $p=.004$)). Descriptive statistics show that mean scores in SP2 ($M_{\text{mean}}=2.848$), SP4 ($M_{\text{mean}}=4.606$) and SP5 ($M_{\text{mean}}=4.432$) for the tenure group (5–8 years) are significantly higher compared with other working tenure groups. Moreover, mean scores in SP1 ($M_{\text{mean}}=4.271$) for the working tenure group (9–12 years) is significantly higher than other working tenure groups. Overall, these results do not give any clear indication of the direction of the relationship between executive working tenure and SP practices. More stringent hypothesis testing by using regression analyses reveals that the tenure of procurement professionals is positively significantly associated ($\beta=.369$, $p=.000$; $\beta=.397$, $p=.000$; $\beta=.275$, $p=.002$) with environment-related SP practices, philanthropic activities and safety, thus confirming that procurement professionals working longer in their role are more concerned with environment-related procurement practices, philanthropic activities and safety compared with professionals having a shorter tenure. Thus, **Hypothesis 5** is partially supported.

5. Discussion

The identification of the demographic characteristics of procurement professionals is an important research area because demographic characteristics also include educational qualification and purchasing expenditure, which further guide an organisation's procurement portfolio, procurement strategy and the procurement function (**UN Procurement Handbook, 2006**).

² Before running regression, correlation analyses were also done. Correlation analyses indicate that there is a significant positive correlation ($r=.311$, $p=.000$) between title/position and the qualification of procurement professionals. We further checked for any multicollinearity among independent variables before running regression and found that there is no multicollinearity among independent variables (Variable Inflation Factor (VIF) values are closer to 1) (results are shown in **Appendix A** section).

Table 5
Results of ANOVA: tenure differences in SP dimensions.

| Dependent variable | Tenure | Total number | Mean | Standard deviation | F | Sig. |
|--------------------|-------------------|--------------|-------|--------------------|-------|---------------|
| SP1 | Less than 5 years | 53 | 3.603 | .944 | 8.224 | .000** |
| | 5–8 years | 70 | 4.221 | .710 | | |
| | 9–12 years | 48 | 4.271 | .555 | | |
| | 13 and above | 53 | 3.931 | .863 | | |
| SP2 | Less than 5 years | 53 | 2.538 | .713 | 2.518 | .059 |
| | 5–8 years | 70 | 2.848 | .707 | | |
| | 9–12 years | 48 | 2.698 | .790 | | |
| | 13 and above | 53 | 2.534 | .742 | | |
| SP3 | Less than 5 years | 53 | 3.038 | .996 | 1.411 | .241 |
| | 5–8 years | 70 | 3.379 | .948 | | |
| | 9–12 years | 48 | 3.257 | .992 | | |
| | 13 and above | 53 | 3.120 | .950 | | |
| SP4 | Less than 5 years | 53 | 3.962 | .987 | 6.930 | .000** |
| | 5–8 years | 70 | 4.606 | .643 | | |
| | 9–12 years | 48 | 4.472 | .765 | | |
| | 13 and above | 53 | 4.161 | .945 | | |
| SP5 | Less than 5 years | 53 | 3.933 | .891 | 4.661 | .004** |
| | 5–8 years | 70 | 4.432 | .673 | | |
| | 9–12 years | 48 | 4.417 | .710 | | |
| | 13 and above | 53 | 4.138 | .981 | | |

** $p < .01$.

Table 6
Results of ANOVA: qualification differences in SP dimensions.

| Dependent variable | Qualification | Total number | Mean | Standard deviation | F | Sig. |
|--------------------|-----------------------|--------------|-------|--------------------|-------|---------------|
| SP1 | Trade qualification | 57 | 3.772 | .814 | 2.385 | .036* |
| | Bachelor's | 103 | 4.087 | .815 | | |
| | Master's and doctoral | 64 | 4.109 | .807 | | |
| SP2 | Trade qualification | 57 | 2.491 | .616 | 3.861 | .022* |
| | Bachelor's | 103 | 2.806 | .722 | | |
| | Master's and doctoral | 64 | 2.585 | .843 | | |
| SP3 | Trade qualification | 57 | 3.053 | .915 | 2.442 | .089 |
| | Bachelor's | 103 | 3.159 | .958 | | |
| | Master's and doctoral | 64 | 3.420 | 1.020 | | |
| SP4 | Trade qualification | 57 | 3.988 | .917 | 5.965 | .003** |
| | Bachelor's | 103 | 4.472 | .761 | | |
| | Master's and doctoral | 64 | 4.344 | .933 | | |
| SP5 | Trade qualification | 57 | 3.921 | .920 | 6.182 | .002** |
| | Bachelor's | 103 | 4.291 | .794 | | |
| | Master's and doctoral | 64 | 4.430 | .776 | | |

* $p < .05$.
** $p < .01$.

Table 7
Impact of demographic characteristics on SP dimensions.

| Dependent variables | Model 1 SP1 | Model 2 SP2 | Model 3 SP3 | Model 4 SP4 | Model 5 SP5 |
|---|----------------|----------------|----------------|----------------|----------------|
| Age 36–50 | -.011 | .043 | .047 | -.080 | -.143 |
| Age 51–60 | -.016 | .104 | .067 | -.014 | -.105 |
| Age 61 and above | .033 | .093 | .087 | .068 | .037 |
| Gender | .165* | .089 | -.076 | .068 | .061 |
| Procurement managers (middle) | -.132 | .071 | .125 | -.081 | .023 |
| Procurement directors | -. 220* | -.114 | -.064 | -.111 | -.091 |
| Experience in the role 5–8 years | .369** | .225* | .236* | .331** | .293** |
| Experience in the role 9–12 years | .397** | .131 | .157 | .295** | .302** |
| Experience in the role 13 years and above | .275** | .067 | .093 | .146 | .146 |
| Bachelor's qualification | .129 | .135 | -.060 | .200* | .140 |
| Master's and doctoral qualification | .211* | .048 | .135 | .187* | .261** |
| Intercept | .000** | .000** | .000** | .000** | .000** |
| R ² | .164 | .100 | .084 | .153 | .155 |
| Adjusted R ² | .121 | .048 | .032 | .105 | .106 |
| Significance (f value) | .000** | .037** | .097 | .001** | .001** |

Note: For the five regression models above, the study has used age=under 35, gender=male, position=first-level, tenure= < five years and education=trade qualification as reference categories/groups.

* $p < .05$.
** $p < .01$.

The current study provides evidence that male and female procurement professionals differ in their responses and that women can be considered active in purchasing recycled packaging, waste-reduction goals and using life-cycle analysis (elements of the environment dimension, SP1). The findings suggest that out of the five dimensions of SP, environment is perceived differently among women. Thus, it can be interpreted that women are more

inclined towards environmentally friendly activities. A plausible explanation for this variance can be that women differ from men in their attitudes, preferences and buying behaviours and generally do more household activities, including reusing bottles and bags, which may explain this variance. This finding accords with the literature (Webster, 1975; Mainieri et al., 1997; Straughan and Roberts, 1999; Homburg and Giering, 2001; Williams, 2003; Stephenson, 2004; Liu et al., 2012) that finds women are more inclined towards environmentally friendly purchasing. However, findings should be interpreted with caution and cannot be extrapolated to show that male procurement professionals are not environmentally friendly.

The current study accords with the literature (Thomas and Simerly, 1994; Manner, 2010) and provides evidence that with longer working tenures, there is a greater opportunity for professionals to acquire knowledge about and experience with their role and responsibility. In line with this, the findings reveal that tenure has a positive and significant impact on environment, philanthropy and safety. Overall, this study provides evidence that the working tenure of procurement professionals can be seen as a measurement of their awareness or knowledge of SP practices. However, this finding should not be generalised because interest in green purchasing and individual preferences also play an influential role.

The current study also provides evidence that position negatively affects the environment and philanthropy dimensions of SP practices; this finding does not corroborate the work of Manner (2010). This study finds that first-level procurement professionals who are procurement administrators are more associated with donations to philanthropic organisations, volunteering at a local charity, helping to increase the performance of suppliers in the local community and are more proactive in environmental concerns compared with top-level procurement professionals. Surprisingly, the position of top-level procurement professionals has a negative relationship with environment and is contrary to some of the literature (Carter et al., 1998). A possible explanation for this result might be that first-level procurement professionals devote more time to environmental and philanthropic issues inside the organisation, whereas top-level procurement professionals look after broader and more strategic aspects of SP practices (such as policy making).

Age is the most discussed demographic characteristic in the literature; however, in this study, analysis of the age of procurement professionals does not establish any effect on the dimensions of SP practices. This means that young, middle-aged and mature-aged procurement professionals do not perceive environment, diversity, human rights, safety and philanthropy differently. A possible explanation for this finding is that the majority of the procurement professionals in this study are mature-aged professionals (see Table 2) and so dominate the sample. Hambrick and Mason (1984) state that there is a possibility that with age the tendency to grasp and implement new ideas declines and that there are other commitments in life which are important. This finding is not consistent with the literature (Anderson and Cunningham, 1972; Carlsson and Karlsson, 1970; Samdahl and Robertson, 1989).

Another important finding is that the qualifications of procurement professionals in this study do positively impact the environment and safety dimensions of SP practices. This finding confirms that qualified procurement professionals are more active in purchasing recycled packaging, setting waste-reduction goals and using life-cycle analysis significantly, and tend to ensure that suppliers' locations are operated in a safe manner and with safe incoming movement of products and services. This is a significant finding because it is anticipated that the educational efforts and knowledge of an individual drive environmentally friendly

activities and safety. It can be genuinely argued that with scholastic and academic knowledge, there is a fair possibility that an individual is aware of the need and urgency to implement environmentally friendly activities in a safe and orderly manner. This finding is in line with the finding of previous studies (Hines et al., 1987; Chan, 1996; Roberts, 1996; Paço and Raposo, 2009) that education influences awareness of environmental concerns. Contrasted with this, Samdahl and Robertson (1989) find that environmentally friendly behaviour is more prevalent in less educated and low-income respondents in the US. Thus, mixed results show that the education of respondents is a strong predictor of environmentally friendly purchasing. Unlike Schaper's (2002) study, this study finds that demographic characteristics, particularly gender, position, tenure and qualification, do predict sustainable environmentally friendly behaviour, philanthropy and safety practices.

6. Concluding remarks

The contribution of this study to the existing purchasing and supply literature is the confirmation that the demographic characteristics of 224 procurement professionals affect their sustainable procurement (SP) practices; to date, this has not been studied to this extent or in this context in the literature. For organisations to remain sustainable, it is imperative to identify concepts that share an association with sustainability, including SP. The lack of SP studies inside Australian universities positions this study uniquely within the literature, thereby strengthening its contribution to the field of SP.

This study has several important implications. First, the study implies that the demographic characteristics of procurement professionals impact socially responsible purchasing, and particularly that the qualifications and tenure of procurement professionals are likely to have a strong impact on environmental, safety and philanthropic activities. Therefore, organisations may want to engage in procurement training and information sessions to enhance socially responsible purchasing. Multi-national organisations may want to hire more experienced procurement staff with long working tenure in order to ensure that human rights and diversity practices prevail. As for putting such characteristics into action, this study implies that qualified procurement professionals are more likely to implement safety measures at suppliers' locations, inducing the safe movement of products. This study further implies that there is room for top-level procurement professionals (such as procurement directors) to undertake environmentally friendly procurement activities, particularly green buying, reducing packaging material and committing to waste-reduction goals. This study also implies that female procurement professionals are more likely to be associated with environmentally friendly activities. Thus, it is likely that environment-related purchasing activities will be enhanced when there are more female procurement staffs in an organisation. This study also has implications for procurement scholars who approach the sustainability crisis by integrating demographic dimensions.

Although this study confirms that some demographic characteristics of procurement professionals influence SP practices, the study's findings are limited to quantitative analysis, particularly regression analysis. Another limitation of the current study is that the quantitative results do not explore the freedom and authority of procurement professionals in ordering or buying products and services. In several instances, it is possible that procurement professionals have little or no authority and discretion in product selection and ordering.

The five SP dimensions in this study are limited to the purchasing social responsibility (PSR) scale. It is possible that

procurement professionals find it difficult to distinguish between “agree” and “strongly agree” and either response could simply indicate neutrality. The study did not include control variables because several of the responses (potential control variables) in the survey were unavailable. Also, some disclosures were kept anonymous to protect the identity of procurement professionals and the sector is uniform.

Future studies may want to extend the dimensions of SP. In this work, demographic characteristics have not been studied in conjunction with procurement strategy and portfolios; future studies can build upon this demographic data and extend the research to a new level. Future studies could investigate why (or why not) the age of procurement professionals has implications for their decision making in the workplace. A further study with a focus on the values and attitudes of procurement professionals and their role in environmentally friendly activities could broaden the area.

Whilst limitations in statistical techniques exist, the contribution of this study lies in the successful confirmation of the effect of the demographic characteristics of procurement professionals on the dimensions of SP in the Australian higher education sector.

Table A1
Correlation.

| | SP1 | Gender | Age bracket | Working in this role (years) | Title/position | Qualification |
|------------------------------|--------|--------|-------------|------------------------------|----------------|---------------|
| SP1 | 1 | .151* | .122 | .119 | -.063 | .148* |
| Gender | .151* | 1 | .125 | -.110 | .116 | .049 |
| Age bracket | .122 | .125 | 1 | .144* | .076 | .091 |
| Working in this role (years) | .119 | -.110 | .144* | 1 | .091 | -.063 |
| Title/position | -.063 | .116 | .076 | .091 | 1 | .311** |
| Qualification | .148* | .049 | .091 | -.063 | .311** | 1 |
| | SP2 | Gender | Age bracket | Working in this role (years) | Title/position | Qualification |
| SP2 | 1 | .097 | .142* | -.037 | -.033 | .040 |
| Gender | .097 | 1 | .125 | -.110 | .116 | .049 |
| Age bracket | .142* | .125 | 1 | .144* | .076 | .091 |
| Working in this role (years) | -.037 | -.110 | .144* | 1 | .091 | -.063 |
| Title/position | -.033 | .116 | .076 | .091 | 1 | .311** |
| Qualification | .040 | .049 | .091 | -.063 | .311** | 1 |
| | SP3 | Gender | Age bracket | Working in this role (years) | Title/position | Qualification |
| SP3 | 1 | .046 | .078 | .005 | .019 | .141* |
| Gender | .046 | 1 | .125 | -.110 | .116 | .049 |
| Age bracket | .078 | .125 | 1 | .144* | .076 | .091 |
| Working in this role (years) | .005 | -.110 | .144* | 1 | .091 | -.063 |
| Title/position | .019 | .116 | .076 | .091 | 1 | .311** |
| Qualification | .141* | .049 | .091 | -.063 | .311** | 1 |
| | SP4 | Gender | Age bracket | Working in this role (years) | Title/position | Qualification |
| SP4 | 1 | .073 | .122 | .039 | .008 | .143* |
| Gender | .073 | 1 | .125 | -.110 | .116 | .049 |
| Age bracket | .122 | .125 | 1 | .144* | .076 | .091 |
| Working in this role (years) | .039 | -.110 | .144* | 1 | .091 | -.063 |
| Title/position | .008 | .116 | .076 | .091 | 1 | .311** |
| Qualification | .143* | .049 | .091 | -.063 | .311** | 1 |
| | SP5 | Gender | Age bracket | Working in this role (years) | Title/position | Qualification |
| SP5 | 1 | .080 | .090 | .062 | .027 | .220** |
| Gender | .080 | 1 | .125 | -.110 | .116 | .049 |
| Age bracket | .090 | .125 | 1 | .144* | .076 | .091 |
| Working in this role (years) | .062 | -.110 | .144* | 1 | .091 | -.063 |
| Title/position | .027 | .116 | .076 | .091 | 1 | .311** |
| Qualification | .220** | .049 | .091 | -.063 | .311** | 1 |

* Correlation is significant at the .05 level (2-tailed).
 ** Correlation is significant at the .01 level (2-tailed).

Appendix A

See Table A1 and Table A2.

Table A2
Multicollinearity.

| Model 1 | Collinearity statistics | |
|------------------------------|-------------------------|-------|
| | Tolerance | VIF |
| Gender | .954 | 1.049 |
| Age bracket | .950 | 1.053 |
| Working in this role (years) | .943 | 1.061 |
| Title/position | .878 | 1.139 |
| Qualification | .889 | 1.125 |

^a Dependent variable: SP11.

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