Developing psychological literacy: Student perceptions of graduate attributes

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Abstract

This cross-sectional study examined student perceptions of psychology graduate attributes (GA) and of psychological literacy (PL), which were expected and found to be significantly related. GA and PL ratings were moderately high, reflecting substantial awareness, perceived development, and perceived importance of these concepts. These perceptions varied as a function of degree programme major and year, and specialist units completed. The general pattern for overall group differences for most GAs, from highest to lowest ratings, was (1) psychology major students who had completed specialist units, (2) psychology major students who had not completed the cornerstone/foundational unit, and (3) non-major students (who had completed a few non-specialist psychology units). Where there were significant interactions, students in Condition 1 tended to give consistently higher ratings in all 3 years, while those in Condition 2 showed some increase across the years, and those in Condition 3 gave lower ratings in Year 3 than in earlier years. All students in Condition 1 indicated that they were aware of the term psychological literacy; this was not the case for the other students. Once PL was defined, however, all students rated this concept as important. The limitations of this study, as well as implications for teaching strategies such as cornerstone and capstone units, are considered.

Key words: capstone, cornerstone, graduate attribute, psychological literacy, undergraduate

This study investigated student perceptions of psychological literacy (PL) and graduate attributes (GAs). Are students aware of these concepts and do they think that they are important? PL is the capacity to adaptively and intentionally apply psychological science to meet personal, professional, and societal needs (Cranney & Dunn, 2011). PL was initially conceived within the context of tertiary education (Boneau, 1990), and McGovern and colleagues (2011) more recently stated that PL encapsulates the common aspects of several different national lists of GAs and learning outcomes (knowledge, skills, and attitudes) that students should acquire while undertaking a major in psychology (e.g., acquiring discipline knowledge and developing a scientific way of thinking).

In Australia, the *Graduate Attributes of the Four-Year Australian Undergraduate Psychology Program* (Cranney et al., 2009) includes discipline knowledge, research, critical thinking, values and ethics, communication, and application; each GA has associated learning outcomes. As a result of a consen-

sual discussion among educators (APAC, 2012; Cranney, Botwood, & Morris, 2012), revisions have recently been made, in particular (1) some minor changes to the learning outcomes and descriptions, and (2) a shift in emphasis to the 3-year major, to the exclusion of the fourth year. The descriptions of the revised GAs were used in this study: GA1: discipline knowledge and its application (demonstrates a broad and coherent body of knowledge of psychology, with depth in the underlying principles and concepts, and an appreciation of the value of applying this knowledge as the basis for lifelong learning); GA2: research methods in psychology (understands the principles of scientific method, and is able to apply and evaluate basic research methods in psychology); GA3: critical and creative thinking skills in psychology (demonstrates the capacity to utilise logic, evidence, and psychological science to evaluate claims about, and solve problems regarding, human behaviour); GA4: values and ethics in psychology (demonstrates appropriate professional values); GA5: communication and interpersonal skills in psychology (demonstrates pre-professional level communication skills); and GA6: learning and application in psychology (demonstrates the capacity to apply psychological principles to meet personal, professional, and societal needs). In a pragmatic sense, the revisions would have had no impact on the experiences and responses of the students across the years examined in this study. Essentially, we argue

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that learning, teaching, and assessment strategies for undergraduate (UG) psychology should be designed to scaffold the development of GAs, and that such development will naturally lead to increased PL. As Dunn, Cautin, and Gurung (2011) stated, '[t]o the extent that the acquisition of core psychological knowledge takes place in the classroom, the obvious channel for cultivating psychological literacy is the undergraduate psychology curriculum' (p. 16).

Although the support of GA development would seem both sensible and desirable from the perspective of students and potential employers, this emphasis on educational outcomes has only been a recent development in higher education generally (e.g., National Centre for Public Policy and Higher Education, 2006; Organisation for Economic Co-operation and Development, 2011), and in psychology specifically (e.g., Cranney & Voudouris, 2012; Lipp et al., 2007; Lunt, Job, Lecuyer, Peiro, & Gorbena, 2011; Trapp et al., 2011). In general, it is expected that in a degree programme where higher year units build upon lower year units, there will be progressive GA development across the years (in this article, 'unit' is a subject or module, several of which make up a degree programme). In addition, the higher education literature has increasingly emphasised the importance of making disciplinary and professional 'ways of thinking' and 'shared understandings' quite explicit to students as part of their education/training, rather than leaving such development to questionable osmotic and implicit processes (Cranney, Morris, Spehar, & Scoufis, 2008; Northedge, 2003). One way that disciplinary and professional thought processes can be introduced explicitly to students is through a cornerstone foundational unit, which often occurs in the first year of a degree programme. The purpose of the cornerstone unit is to provide students with a solid foundation of the core knowledge, skills, and attitudes that are required for subsequent success in the programme (Burris, 1998; Pilling, Rigdon, & Brightman, 2012).

In the final year of a degree programme, a capstone experience or unit can also be introduced and can serve a number of purposes, including consolidation of learning across the discipline units (Dunn & McCarthy, 2010; Johnson, Close, Kite, & Tuskenis, 2011; McNamara et al., n.d.; Wadkins & Miller, 2011). A particular advantage of capstone experiences is to give students the opportunity to explicitly recognise the extent of their development of GAs and link this to future career development. Thus, students' awareness of GAs, realisation of the importance of GAs, and willingness to take opportunities to develop GAs should be linked to student engagement and subsequent success both in completing their degree programmes and in embarking on their careers. In general, students should be more motivated to develop the learning outcomes of their chosen discipline or profession, and so for example those students who have chosen to major in psychology will have more awareness and positive perceptions of psychology GAs than will those students who have not chosen to major in psychology.

The current study examined factors that could influence students' perceptions regarding psychology GAs, in particular students' rated awareness, importance, and development of GAs. We hypothesised that these ratings should increase as a function of (1) whether they have chosen to major in psychology, as they will presumably be more motivated to take opportunities to develop psychology GAs; (2) the year level in their degree programme, and similarly the number of psychology units in psychology (we acknowledge that these factors interact with the discipline major chosen); and (3) whether they have completed specialist units, such as cornerstone or capstone units, that explicitly focus on GA acquisition. For example, in assessable journal tasks, students are asked to reflect on aspects of the unit that focus on research training (GA2) and communication (GA5). In addition, the concept of PL is introduced. In the third-year capstone unit, students are asked to document in detail their development of each GA, and in their final journal task they are asked to explicitly reflect on PL, which has been discussed in the lecture and practical classes. In particular, the hypotheses of this study were as follows:

Hypothesis 1: There will be a positive correlation between ratings of GA awareness, development, and importance, and ratings of PL importance and development.

Hypothesis 2: Students majoring in psychology will rate GA awareness, development, and importance higher than those who are not majoring in psychology. Furthermore, this will become more evident across Years 1–3, and it will be enhanced by completing specialist psychology units. In support of this hypothesis, there will also be a positive correlation between the number of completed psychology units, and students' ratings of GA awareness, development, and importance.

Hypothesis 3: Students majoring in psychology will be more aware of PL. Moreover, they will rate the importance and their own development of PL higher than those not majoring in psychology. Furthermore, this will become more evident across Years 1–3 and be enhanced by completing specialist psychology units. In support of this hypothesis, there will be a positive correlation between the number of completed psychology units and rated PL development and importance.

METHOD

Participants

Recruitment of participants was undertaken in three ways. All first, second, and third year students who were enrolled

in a psychology unit at the time of this study were contacted via an announcement on the unit website, which included a link to the survey. Second, posters advertising the survey were displayed around the psychology building in key locations, such as adjacent to lifts. Third, a link to the survey was posted on the Psychology Student Society's Facebook page.

A total of 213 participants responded to the survey. This was from an estimated sample of 2,168, which yields a response rate of 9.87%. Although this would normally be considered low, one needs to take into account the 6-day time frame for response and the methods of recruitment. We classified participants into psychology majors and non-majors. Non-majors may have completed psychology units as a minor, or as elective or core units. All Bachelor of Psychology and Bachelor of Psychological Science students necessarily majored in psychology. For all other students, if they had completed five or more psychology units in Year 2, or eight or more in Year 3, they were considered psychology majors. The remaining first year students were asked whether they intended to major in psychology. In addition, an adjustment to the undergraduate year was made for all students enrolled in a double degree to equate their year level of psychology to their peers. These adjustments resulted in 98 Year 1 students, 68 Year 2 students, 42 Year 3 students, and 5 Year 4 students. Given the low numbers, the data of the Year 4 students were omitted, which is appropriate given that the revised GAs are now focused on psychology major.

This final sample consisted of 154 females, 52 males and two gender-non-respondent participants (mean age = 20.85; standard deviation (*SD*) = 5.27). Across the different groupings for analysis (see later), a series of preliminary analyses determined that the proportion of males and females did not differ across those groups, nor did the proportion of Native and Non-native English speakers. Across the final sample of 208 participants, in answer to the question 'What is your cultural background? (use as many words as you like, e.g., Australian Irish Aboriginal)', 117 reported 'Australian' and 107 reported 'Chinese' (and 42 of these two groups had reported 'Australian-Chinese'), 33 reported European, 20 reported UK, and 15 reported subcontinent (of varying kinds). Other students reported a variety of cultural backgrounds (e.g., Middle East, Americas, New Zealand). Note that many used several terms so these numbers exceed 208.

Design

The dependent variables were the student ratings of their awareness and perceptions of GA and PL. Students were grouped according to their academic history: NoMajor (no psychology major), Major (major in psychology, but without the cornerstone unit completed), and MajorSp (major in

psychology and had completed the specialist cornerstone unit, and in the case of Year 3 students, the capstone unit). The second pre-existing grouping factor was degree programme year (1, 2, 3).

Materials and procedure

The University of New South Wales Human Research Ethics Advisory Panel approved the proposed research, which also conforms to the provisions of the Declaration of Helsinki. An online survey was developed using Key Survey, and was made available to participants for a period of up to 6 days. It comprised five types of questions:

1. University status—degree programme, undergraduate year;
2. Psychology studies—number of psychology units completed, completion of cornerstone unit and capstone unit;
3. Demographic questions—age, native language, gender, cultural background;
4. GAs—for each of the six psychology GAs, participants were asked to rate on an 11-point scale: (i) 'To what extent have you been made aware of this graduate attribute in your psychology courses?' (0 = not at all aware; 10 = highly aware); (ii) 'How important/valuable do you consider this graduate attribute to be?' (0 = Not at all important/valuable; 10 = highly important/valuable); (iii) 'How much have you developed this attribute so far in your psychology courses?' (0 = Not at all; 10 = To a very high level—that is, graduate level); and
5. Psychological literacy—participants were asked whether they were aware of the concept of PL (yes/no response). A brief definition was then given, and participants were asked to rate on an 11-point scale (i) 'How important do you think it is that psychology students have the opportunity, in psychology courses, to develop their psychological literacy?' (0 = Not at all important; 10 = Extremely important) (PL-Importance); and (ii) 'How developed is your own psychological literacy?' (0 = Not at all developed; 10 = Extremely well developed') (PL-Developed).

There was also an opportunity for participants to provide any additional comments on the survey, GAs, and/or PL.

RESULTS

Hypothesis 1 was supported in that there were significant positive correlations between all the GA variables and PL-Importance and PL-Development (see Table 1). It should also be noted that all individual GA awareness, development, and importance ratings correlated significantly with

Table 1 Intercorrelations between the GA ratings and the number of units completed, and the PL ratings (*n* = 208)

		Number of units	PL-Importance	PL-Development
GA1	Awareness	0.226**	0.304**	0.340**
Knowledge	Development	0.354**	0.350**	0.583**
	Importance	0.254**	0.515**	0.361**
GA2	Awareness	0.348**	0.363**	0.388**
Research methods	Development	0.381**	0.234**	0.516**
	Importance	0.240**	0.484**	0.342**
GA3	Awareness	0.294**	0.436**	0.361**
Critical thinking	Development	0.364**	0.304**	0.564**
	Importance	0.305**	0.549**	0.309**
GA4	Awareness	0.076	0.347**	0.343**
Values and ethics	Development	0.132	0.321**	0.469**
	Importance	0.097	0.457**	0.272**
GA5	Awareness	0.230**	0.339**	0.381**
Communication	Development	0.273**	0.335**	0.557**
	Importance	0.187**	0.391**	0.252**
GA6	Awareness	0.190**	0.383**	0.459**
Application	Development	0.226**	0.332**	0.698**
	Importance	0.269**	0.558**	0.365**
Average	Awareness	0.277**	0.447**	0.467**
	Development	0.363**	0.392**	0.708**
	Importance	0.267**	0.597**	0.384**

Note. GA = graduate attribute, PL = psychological literacy.
** *p* < .01 level (two-tailed).

each other (range: 0.25–0.71), as did the average GA awareness, average GA development, and average GA importance ratings (range: 0.59–0.72; a full correlational table is available upon request).

To examine Hypothesis 2, group × year analyses of variance (ANOVAs) were conducted. Table 2 presents the means and *SD*s for all of the GA ratings as a function of group and year. The primary analysis was for the average ratings across all GAs. For the average GA awareness ratings, there was a significant group main effect in the expected direction, $F(2, 199) = 12.29$, $p < .001$, $\eta_p^2 = 0.11$. That is, MajorSp students rated awareness higher than did Major students, $t(83.3) = 3.71$, $p < .001$, $d = 0.68$, who in turn gave higher ratings than did NoMajor students, $t(177) = 2.58$, $p = .011$, $d = 0.39$. For the average development ratings across all GAs, there was a significant group main effect in the expected direction, $F(2, 199) = 5.21$, $p = .006$, $\eta_p^2 = 0.05$. That is, MajorSp students tended to rate their development higher than did Major students, $t(70.9) = 1.75$, $p = .085$, $d = 0.33$, who in turn gave higher ratings than did NoMajor students, $t(177) = 2.49$, $p = .014$, $d = 0.37$. For the average importance ratings across all GAs, there was a significant group main effect in the expected direction, $F(2, 199) = 8.99$, $p < .001$, $\eta_p^2 = 0.08$. The Major group gave higher ratings than did the NoMajor group, $t(159.7) = 4.06$, $p < .001$, $d = 0.61$. However, there was no difference between ratings of MajorSp and Major students.

A similar analysis approach was taken for each of the individual GAs, and the significant results only are reported in Table 2, with no correction for experiment-wise error.

Inspection of the means suggest that MajorSp students tended to 'start high' and increase their ratings very little over the years (except for development), whereas Major students tended to start lower and increase ratings over the years, and NoMajor students gave decreased ratings in Year 3, after an initial increase in Year 2. The significant interactions, and the only significant main effect for year (GA2 Development), are depicted in Fig. 1.

For the sake of brevity, the substantive exceptions to the general pattern of main and interaction effects described earlier are listed here. For GA4, the pattern of findings was quite different than for GA1, GA2, and GA3 (see Table 2). Unexpectedly, the MajorSp students, similar to the NoMajor students, tended to show decreases across the years, whereas the Major students tended to show the expected increases across the years. The ANOVA revealed that for GA4-Awareness, there was a significant group main effect, $F(2, 197) = 3.47$, $p = .033$, $\eta_p^2 = 0.03$, but there were no significant differences with follow-up contrasts between pairs of groups. For GA4-Importance, there was a significant group main effect, $F(2, 199) = 6.05$, $p = .003$, $\eta_p^2 = 0.06$, but there were no significant differences with follow-up contrasts between pairs of groups.

Table 1 indicates that Hypothesis 2 is supported by significant positive correlations between the number of psychology units completed, and awareness, development, and importance ratings of each of the GAs, except for GA4.

To examine Hypothesis 3, initially chi-square analyses were conducted. A greater proportion of MajorSp students were aware of the concept of PL than was the case in the

Table 2 GA ratings as a function of major grouping and degree programme year (*SD* in brackets)

| | | NoMajor | | | Major | | | MajorSP | | | 3 × 3 ANOVA significant results | | | | | | | | |
| | | | | | | | | | | | Group main effects | | | Year main effects | | | Interaction effects | | |
		Year 1 (n = 57)	Year 2 (n = 19)	Year 3 (n = 9)	Year 1 (n = 8)	Year 2 (n = 13)	Year 3 (n = 10)	Year 1 (n = 33)	Year 2 (n = 36)	Year 3 (n = 23)	F	df2	η_p^2	F	df2	η_p^2	F	df2	η_p^2
Average	Aware#	6.01 (1.80)	5.94 (1.82)	4.88 (2.85)	7.98 (0.73)	7.55 (1.13)	7.58 (1.08)	6.05 (2.12)	6.93 (1.47)	7.06 (1.65)	12.29**	199	0.11						
	Devel.	5.64 (1.51)	5.73 (1.40)	5.51 (2.35)	6.42 (1.46)	6.70 (0.86)	7.02 (0.76)	5.56 (1.68)	6.43 (1.23)	7.01 (1.48)	5.21**	199	0.05						
	Import#	6.96 (1.85)	7.24 (1.77)	6.69 (2.86)	8.46 (0.93)	8.33 (0.93)	8.13 (1.11)	7.78 (1.61)	8.37 (1.13)	7.91 (1.59)	8.99**	199	0.08						
GA1 Knowledge	Aware.	5.04 (2.43)	5.84 (2.03)	2.75 (2.82)	7.25 (1.28)	7.38 (2.29)	7.30 (2.45)	5.30 (2.26)	6.06 (2.28)	6.17 (2.96)	10.79**	198	0.10				2.60*	198	0.05
	Devel.	5.25 (1.77)	5.63 (1.74)	4.88 (2.36)	6.38 (1.51)	7.00 (1.76)	7.90 (1.37)	5.48 (1.68)	6.23 (1.61)	6.44 (2.00)	8.18**	196	0.08						
	Import.	6.71 (2.16)	7.11 (2.28)	6.38 (2.93)	7.86 (1.86)	8.62 (1.33)	8.70 (1.42)	7.48 (1.92)	8.17 (1.61)	7.44 (2.21)	6.14**	196	0.06						
GA2 Research methods	Aware#	6.23 (2.15)	6.05 (2.17)	4.78 (2.99)	8.75 (1.28)	7.69 (2.10)	8.80 (1.03)	6.52 (2.45)	7.56 (1.42)	7.91 (1.91)	17.20**	199	0.15				3.15*	199	0.06
	Devel.	5.72 (1.92)	5.84 (1.71)	4.89 (2.37)	6.13 (1.55)	6.62 (1.56)	8.11 (1.69)	5.38 (2.27)	6.53 (1.59)	7.48 (2.21)	5.58**	197	0.05	3.37*	197	0.03	3.33*	197	0.06
	Import.	6.98 (2.23)	7.05 (1.84)	6.33 (2.83)	8.63 (1.06)	8.31 (1.25)	8.70 (1.83)	7.47 (2.23)	7.89 (1.98)	7.91 (2.21)	6.86**	197	0.07						
GA3 Critical thinking	Aware#	5.84 (2.37)	5.63 (2.06)	5.11 (3.33)	8.00 (1.41)	7.62 (1.26)	8.00 (1.41)	6.33 (2.64)	7.06 (1.97)	7.39 (1.90)	11.83**	198	0.11						
	Devel.	5.54 (2.02)	5.63 (1.95)	5.11 (2.67)	6.50 (1.51)	6.77 (1.30)	7.50 (1.08)	5.61 (2.09)	6.47 (1.76)	7.04 (1.77)	8.01**	199	0.08						
	Import#	6.77 (2.19)	7.21 (2.15)	6.88 (3.27)	8.88 (1.13)	8.54 (1.33)	9.00 (1.25)	8.00 (1.95)	8.83 (1.30)	7.83 (1.97)	11.29**	197	0.10						
GA4 Ethics and values	Aware#	6.74 (2.49)	6.21 (2.15)	5.56 (3.97)	8.75 (1.49)	7.50 (2.07)	5.70 (1.16)	6.56 (2.77)	7.25 (2.26)	7.09 (1.86)	3.47*	197	0.03						
	Devel.	6.30 (2.06)	5.84 (2.01)	6.33 (2.69)	7.13 (2.10)	6.46 (2.03)	6.70 (1.70)	6.00 (2.42)	6.67 (1.90)	7.46 (1.92)									
	Import#	7.30 (2.22)	7.42 (2.17)	6.33 (3.35)	8.75 (1.91)	8.00 (2.08)	6.60 (1.90)	7.97 (2.11)	8.56 (1.63)	8.22 (1.59)									
GA5 Communication	Aware#	6.07 (2.13)	5.68 (2.29)	5.00 (3.16)	7.63 (0.92)	7.62 (1.45)	7.67 (2.45)	5.55 (2.40)	6.75 (1.98)	6.68 (2.36)	6.05**	199	0.06						
	Devel.	5.54 (1.79)	5.53 (1.95)	5.67 (2.55)	6.13 (1.46)	6.77 (1.54)	6.70 (1.06)	5.55 (1.91)	6.19 (2.05)	7.09 (2.11)	6.36**	197	0.06						
	Import.	6.96 (2.21)	7.47 (2.32)	7.22 (3.15)	8.57 (1.40)	8.54 (1.39)	7.80 (1.99)	7.85 (1.94)	8.43 (1.65)	7.91 (1.93)									
GA6 Application	Aware#	6.12 (2.06)	6.21 (2.07)	5.56 (3.50)	7.50 (0.53)	7.46 (1.90)	7.20 (1.55)	6.03 (2.34)	6.92 (1.98)	7.17 (2.04)	3.85*	199	0.04						
	Devel.	5.49 (1.84)	5.89 (1.76)	5.89 (2.42)	6.25 (1.83)	6.62 (1.33)	6.33 (1.22)	5.36 (2.03)	6.41 (1.50)	6.65 (1.90)									
	Import.	6.95 (2.06)	7.16 (1.89)	6.89 (2.98)	7.75 (0.89)	8.00 (1.58)	8.00 (1.56)	7.82 (1.70)	8.36 (1.57)	8.17 (1.59)	6.42*	199	0.06						
PL	Devel.	5.09 (1.87)	5.83 (1.34)	5.56 (2.46)	6.25 (1.75)	6.23 (1.24)	7.13 (1.55)	4.70 (2.08)	5.83 (1.47)	7.26 (1.54)	3.76*	195	0.04	5.69**	195	.06			
	Import.	7.38 (2.10)	7.44 (1.98)	8.00 (2.12)	7.88 (1.25)	8.39 (1.26)	8.00 (2.11)	8.52 (1.56)	8.23 (1.54)	8.52 (1.62)									

Note. NoMajor = students not undertaking a psychology major and who have not completed the cornerstone unit; Major = students undertaking a psychology major and who have not completed the cornerstone unit; MajorSp = students undertaking a psychology major and who have completed the specialists units. GA = graduate attribute. PL = psychological literacy; Aware = awareness; Devel. = development; Import. = importance. GAs were rated on an 11-point scale (0–10). Df1 for group = 2, df1 for year = 2, df1 for interaction = 4. *Significant at the 0.05 level, two-tailed. **Significant at the 0.01 level, two-tailed. #These analyses did not pass Levine's test of homogeneity, but (1) they do not exceed the 0.001 criterion, and (2) ANOVA is considered to be robust to violations of homogeneity.
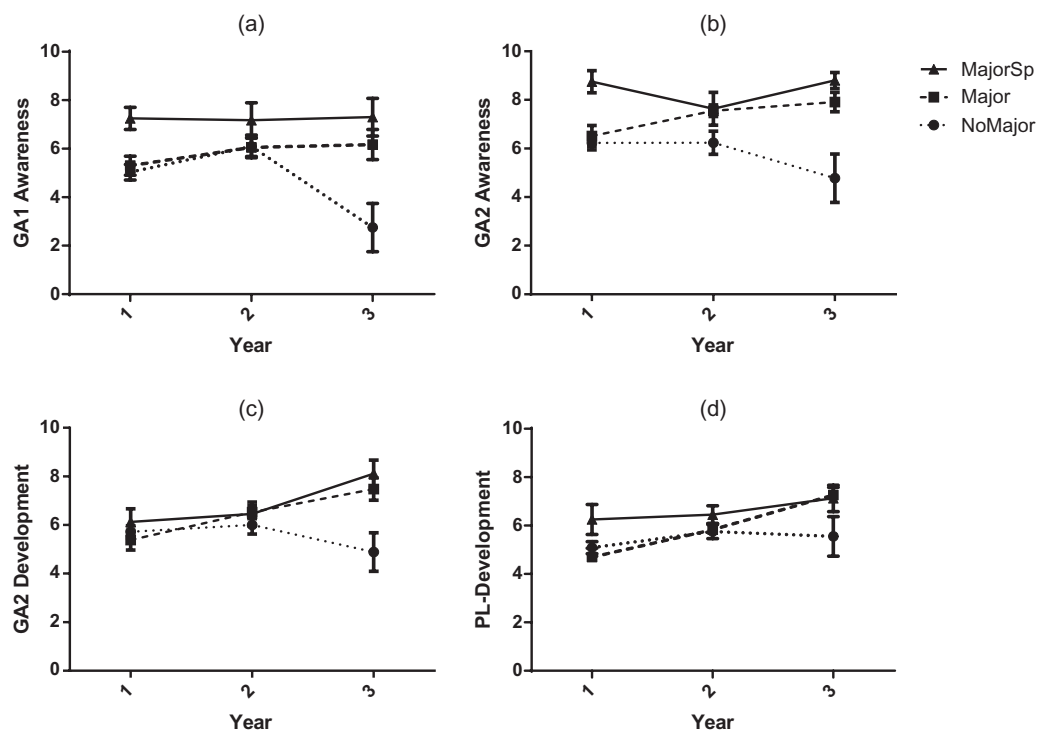
Figure 1 (a) GA1 awareness as a function of group and degree programme year. (b) GA2 awareness as a function of group and degree programme year. (c) GA2 awareness as a function of group and degree programme year. (d) PL-D as a function of group and degree programme year. NoMajor = students not undertaking a psychology major; Major = students undertaking a psychology major and who have not completed the cornerstone unit; MajorSp = students undertaking a psychology major and who have completed both specialists units. GA = graduate attribute, PL-D = psychological literacy development.

other two groups, χ^2 (4) = 32.62, $p < .001$, $w = 0.40$. Then, a set of ANOVAs similar to that used to test Hypothesis 2 was conducted.

Table 2 presents the means and SDs for the PL-Importance and PL-Development ratings as a function of group and year. The ANOVA yielded a main effect of group, $F(2, 195) = 3.76$, $p = .025$, $\eta_p^2 = 0.04$. That is, MajorSp students tended to rate development higher than did Major students, $t(116) = 1.97$, $p = .051$, $d = 0.47$, who in turn tended to give higher ratings than did NoMajor students, $t(175) = 1.71$, $p = .090$, $d = 0.26$ (see Fig. 1d). There was also a main effect of year, $F(2, 195) = 5.69$, $p = .004$, $\eta_p^2 = 0.06$, indicating an increase across the years. For PL-Importance, the ANOVA yielded no significant effects.

Hypothesis 3 was also supported by the significant positive correlation between the number of units and PL-Importance, $r(203) = 0.14$, $p = .047$, and between the number of units and PL-Development, $r(202) = 0.38$, $p < .001$. There was also a significant correlation between PL-Importance and PL-Development, $r(200) = 0.38$, $p < .001$, all two-tailed.

Twenty participants provided responses to the open-ended question, which were coded into 40 distinct statements, 22 being relevant to GAs, their application, and/or PL. Five of these indicated satisfaction with GAs and/or PL experience,

with 17 others suggesting the need for more emphasis on the acquisition and/or application of GAs/PL.

DISCUSSION

To our knowledge, this is the first study to examine student perceptions of PL, and to document a strong relationship between GAs and PL (Hypothesis 1). Across all participants, GA and PL ratings were moderately high, that is, almost always above the mid-point on the rating scale. This reflects substantial awareness, perceived development, and perceived importance of these concepts. There was evidence of variation in these perceptions as a function of major, year, and specialist course completed. For the GAs (Hypothesis 2), there was little evidence for the expected increase across years. There was a preponderance of main effects for groups, and some interactions. The general pattern for most GAs, from highest to lowest ratings, was MajorSP, Major, NoMajor. Where interactions were significant, the MajorSP students tended to give consistently higher ratings across the 3 years, while the Major students showed some increase across the years and the NoMajor students gave lower ratings in Year 3 than in earlier years. In support of Hypothesis 2, there were positive correlations between the number

of psychology units and all of the GA variables. In terms of Hypothesis 3, all MajorSp students indicated that they were aware of the term psychological literacy, whereas this was not the case for the Major and NoMajor groups. Once PL was defined, however, all students rated this concept as important.

Graduate attributes ratings

The general pattern of high GA ratings for MajorSP across the year groups suggests that once introduced to GAs in the cornerstone unit, students (1) retain a high awareness of the GAs, (2) consider that these GAs are reasonably well developed, and (3) consider them to be important. Contrary to expectations, in general there was not the expected increment over the years for perceived development. It may be that students are continually shifting their point of reference to be relative to the new challenges of their current year of study, rather than anchoring to earlier years of study. Future research could test that possibility by having Year 3 students rate their development retrospectively over each of the 3 years.

In general, although it may be tempting to conclude that the cornerstone unit had an immediate and lasting positive influence on this group's GA ratings, an alternative explanation is that these students, who were mostly Bachelor of Psychology students, were highly motivated (given their expectations of becoming professional psychologists) and high achievers (given that the academic entry requirement was high). Thus, their performance in their psychology units is likely to be higher than most of their fellow students, and so consequent to this, their GA ratings are likely to be higher.

The Major students (i.e., those who had not completed the cornerstone unit) performed as expected in that the ratings tended to increase over the years, presumably because of their increased exposure to psychology units. The NoMajor students, by contrast, tended to give lower ratings in Year 3. This could be explained in terms of (1) the fact that they would be completing more units in their non-psychology major, and fewer units in psychology, and (2) they may be comparing their coverage of the GAs with that of their psychology major classmates, who by necessity complete more units in psychology. As one NoMajor student commented, 'I'm surprised at how unaware I am of the attributes that are aimed to be achieved by Science/Psychology students'.

Although there were some minor variations on this general pattern of responding across the GAs, one notable exception is that there were significant group main effects for GAs 1, 2, and 3, whereas this is not the case for GAs 4, 5, and 6 (see Table 2). As one third year student commented, '[g]raduate attributes 1–3 were reinforced throughout my psychology degree, but I felt that I only became aware of graduate attributes 4–6 and the concept of psychological literacy through the course PSYC3011 (Psych Applications)'.

Clearly, these GAs require more explicit attention in the curriculum. Indeed, it has been found that there are substantial gaps in the development of ethics (GA4) in undergraduate psychology education both in Australia and other countries (Davidson & Morrissey, 2011).

The only significant year effect was for GA2 (research training) development. This could be explained in terms of (1) the challenging nature, and thus memorability, of this material, including for the Year 1 MajorSp students, or (2) the fact that most research method units are clearly named as such (e.g., 'research methods'), and thus assure alignment with the relevant GA—this may not be so clear for the other GAs. Future research could explore these alternative explanations by, for example, investigating perceptions in programmes where there are clearly labelled units, such as 'critical thinking in psychology'.

Psychological literacy

The MajorSp students were more aware of this term compared with the other groups, which likely reflects their exposure to the term in their cornerstone unit. Once given the definition (Cranney & Dunn, 2011), however, all students tended to rate this concept as being very important. Although the hypothesised positive correlation between GAs and PL indicates an association, whether this is causal and in the proposed direction (i.e., GAs contributing to a 'gestalt' sense of PL; Cranney & Dunn, 2011) cannot be determined by this correlational study. For example, the relationship may be reciprocal, whereby once some amount of PL is gained there is a motivational bias towards learning more—that is, developing GAs further.

Implications and conclusions

Overall, it appears that completing a major, and completing specialist units in psychology, is associated with greater PL. The relative contribution of the cornerstone and capstone specialist units will need further investigation, and future research could also seek to overcome the inherent limitations of the cross-sectional design by utilising a cross-sequential design (Schaie & Strother, 1968; see also Wilson-Doenges & Gurung, 2013). Nevertheless, the current study has made a significant contribution to research that aims to establish the most effective learning, teaching, and assessment strategies to best enable students to develop psychology GAs and PL.

Indeed, this was the first study to measure student perceptions of PL, and clearly further research is required, particularly with linking perceptions to performance. Nevertheless, findings indicated that students have some awareness of the GA and PL concepts, their importance, and the student's own personal level of development. A recommended strategy is for students to track the development of

their GAs throughout their UG major programme using a GA portfolio, so that they (1) become more aware of their achievements, and where improvements are needed, and (2) can use the portfolio material to support career development and achievement both during and after their degree programme studies (Cranney et al., 2005; Cranney, Morris, & Botwood, in press; see http://www.groups.psychology.org.au/PsyEd/education_resources/). The development of career readiness is particularly important for psychology major students because less than 25% will actually go on to become professional psychologists or psychological scientists (Cranney et al., 2012; Halpern, 2010; Lantz, 2011). Notwithstanding the superior ratings of the psychology major students, it is worth noting that even the non-major students report developing their GAs and PL in the context of their psychology units. It is clear then that the importance of the development of PL for all undergraduate students, regardless of their career destinations, cannot be overemphasised. Therefore, purposeful strategies to achieve such development should remain a focus of individual psychology units as well as the undergraduate programme as a whole (see Chester, Burton, Xenos, & Elgar, 2013; Cranney & Dunn, 2011; Cranney & Morris, 2011; Dunn et al., 2013; Karantzas et al., 2013; Knott, Mak, & Neill, 2013; Owens & White, 2013; http://www.psychologicaliteracy.com).

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