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Predicting career development in hard of hearing adolescents in Australia

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Abstract

This article reports on a study investigating the career development of hard of hearing high school students attending regular classes with itinerant teacher support. We compared 65 hard of hearing students with a matched group of normally hearing peers on measures of career maturity, career indecision, perceived career barriers, and three variables associated with Social Cognitive Career Theory: career decision-making self-efficacy, outcome expectations, and goals. In addition, the predictors of career maturity and career indecision were tested in both groups. Results indicated that (a) the two groups did not differ on measures of career maturity, (b) the SCCT variables were less predictive of career behaviours for the hard of hearing students than for the normally hearing students, and (c) perceived career barriers related to hearing loss predicted lower scores on career maturity attitude for the hard of hearing students. These findings are discussed in the context of career education and counselling interventions that may benefit young people who are hard of hearing.

Career theorists and researchers emphasize the importance of the development of career maturity and career exploration skills and attitudes for adolescents to successfully negotiate the school-to-work transition and achieve optimal career outcomes, particularly in the rapidly changing world of work that currently exists in Western societies (Blustein, 1997; Patton, 2000; Sweet, 1998). For young people who are deaf or hard of hearing, communication difficulties combined with environmental and attitudinal barriers may constitute potential disadvantages in achieving educational and career outcomes (Punch, Hyde, & Creed, 2004). It is important for these young people to engage in careful career exploration and planning in order to minimize these potential disadvantages and avoid the cycle of unemployment and underemployment that has characterized the lives of many deaf and hard of hearing people (Bullis, Bull, Freeburg, & Sendelbaugh, 1990; Schildroth, Rawlings, & Allen, 1991). In addition, strong career decision-making skills are likely to reduce the extremely high (estimated at 75%) rate of non-completion of university degrees among this population (Stinson & Walter, 1997).

In most English-speaking countries, increasing numbers of children with significant hearing loss are being educated in regular classes with the support of itinerant teachers of the deaf and using, primarily, oral communication. In Australia, the itinerant teacher model of support has increasingly become the major educational approach for students with hearing loss. Currently, an estimated 84% of students with significant permanent hearing loss attend regular schools with support from itinerant teachers of the deaf; these students use their amplified residual hearing and communicate orally. Most of the remaining 16% are placed in special education units in regular schools and attend the schools' regular classes to varying degrees; in many cases, their communication mode includes a sign language (Hyde & Power, 2003, 2004).

The present study investigated the experiences of students attending regular classes with itinerant teacher support in Australia. These students have sensorineural hearing losses ranging from mild to profound, with a surprisingly high number having severe and profound losses – a recent study found 32% of such students to have a severe loss and 32% a profound loss (Power & Hyde, 2002). Their communication mode is primarily oral and they effectively use their residual hearing supplemented by

speechreading and assistive hearing devices. These students may be functionally defined as hard of hearing.

In considering the career development of adolescents, career maturity is a widely used and valuable construct. Derived from the developmental career theory of Super, career maturity involves the readiness and ability of an individual to perform necessary career-related tasks and make informed, age-appropriate career decisions (Super, 1957; Super, Savickas, & Super, 1996). The developmental nature of the construct means that individuals' career maturity is relative to their life stage and to their coping in relation to their peers. Career maturity in adolescence has been linked empirically with positive long-term outcomes, such as occupational satisfaction at age 25 (Super, Kowalski, & Gotkin, 1967) and a more successful transition nine months postschool (Patton, Creed, & Muller, 2003). It may be particularly crucial for young people with disabilities if they are to overcome the disadvantages associated with their disability and succeed vocationally (Ochs & Roessler, 2001).

Career indecision is a construct closely related to career maturity, and has been seen as one of six measures of career maturity (Levinson, Ohloer, Caswell, & Kiewra, 1998). Indecision differs from indecisiveness, which is a personal trait affecting a range of decision-making situations; rather, indecision is "a developmental phase through which individuals may pass on their way to reaching a decision" (Osipow, 1999, p.147). The assessment of career indecision involves identifying difficulties that impede career decision-making (Osipow & Fitzgerald, 1996). Research has found less career indecision among students with higher career maturity (Brusoki, Golin, Gallagher, & Moore, 1993).

Social Cognitive Career Theory (SCCT) (Lent, Brown, & Hackett, 1994, 2002) provides a useful framework for the investigation of adolescent career development. A recent addition to the career development field, SCCT is currently accepted as a particularly well-established and sound empirically-based theory (Blustein, 1999; Brown, 2002). The theory focuses on issues of preparation for, and implementation of, career choice and career entry and on the life periods of adolescence and early adulthood, and is conceptualised as being relevant to both academic and career behaviours (Lent et al., 1994). The theory's emphasis on diversity and contextual and environmental factors makes it particularly fitted to the investigation of the career development of adolescents with hearing loss.

In its application to the process of career decision-making, SCCT posits a relationship between (a) people's self-efficacy beliefs about their ability to perform tasks related to career decision-making, (b) their outcome expectations regarding the relevance of performing career decision-making tasks to the success of future career decisions, (c) their career exploration and decision-making intentions and goals, and (d) their career behaviours such as planning and exploration.

Of the SCCT variables, career decision-making self-efficacy (CDMSE) has been the most widely researched, with many empirical studies attesting to its positive association with participation in career decision-making tasks and behaviours. Betz and Luzzo (1996) provided a review of such studies; more recent studies have confirmed the association (Anderson & Brown, 1997; Brown, Darden, Shelton, & Dipoto, 1999). Confirming the SCCT model, a study reported by Betz and Voyten (1997) found levels of CDMSE to be positively correlated with outcome expectations, and outcome expectations to be strongly related to goals, in a sample of 350 undergraduate university students.

SCCT emphasises the influence of contextual and environmental factors in individuals' career choices and behaviours and has proposed ways by which personal and environmental barriers can mediate the relationship between interests and career goals and lead individuals to compromise their goals (Lent et al., 1994; Lent, Brown, & Hackett, 2000). McWhirter (1997) pointed out the influence of perceived career barriers on critical decisions faced by adolescents about whether to complete high school or pursue postsecondary education. The perception of career barriers may lead people to compromise their occupational goals (Gottfredson, 1981), and may cause an anxious, unconfident approach to the career decision-making process (Luzzo & Hutcheson, 1996). Thus, perceived career barriers can constitute a crucial element in adolescents' career development.

Because of factors such as reduced auditory access to incidental learning and less experience of part-time work during their high school years, the career development of adolescents with hearing loss may be at risk, and it could be expected that hard of hearing young people may have lower levels of career maturity than their normally hearing peers (Punch et al., 2004). There is a paucity of empirical studies investigating the career development of young people with hearing loss, particularly with those who may be defined as hard of hearing. The findings of studies conducted

with samples of students attending segregated educational settings – both schools for the deaf and special education resource units within regular schools – have not been consistent. (For a detailed review of these studies, see Punch et al., 2004). In a study in which teachers and counsellors evaluated the career decision-making skills of senior students at residential and day schools, 61% of students were considered to be deficient in occupational knowledge and 40% were considered to be unaware of their vocational aptitudes and interests (Schroedel, 1991, 1992). Comparing 71 students in grades 10-12, 57 of whom attended residential schools for the deaf and 14 of whom were based in programs in regular schools, to a group of normally hearing students, King (1990a; 1990b; 1992) found similar mean scores on the Career Development Attitude scale of the Career Development Inventory (Thompson, Lindeman, Super, Jordaan, & Myers, 1981) for the two groups. A New Zealand study (Furlonger, 1998) investigated the career development of 26 high school students with hearing loss attending resource classes for the deaf in regular schools and a matched control group of normally hearing peers. The students with hearing loss scored significantly lower than their normally hearing peers on three scales of the Australian version of the Career Development Inventory (CDI, Lokan, 1984) - Career Planning, World of Work Information, and Career Decision Making – while showing no significant difference on the fourth scale, Career Exploration.

Thus, although career maturity levels and career decision-making abilities are of crucial importance to young deaf and hard of hearing people, the literature suggests, and provides some evidence, that adolescents with hearing loss have lower levels of career maturity, involving reduced career awareness and lower career decision-making competencies, than normally-hearing adolescents. However, no studies have been reported that have investigated the career development of hard of hearing adolescents in fully integrated school settings – a major group of students, given current policies and trends toward inclusive education. Knowledge about this population's career maturity and career decision-making processes can inform the design and implementation of career education and counselling interventions to help these young people make a sound transition from school to their future occupational lives.

The purpose of the present study was to compare the career development behaviours and attitudes of hard of hearing adolescents with those of normally hearing

peers and to test the relationship among career development and contextual variables for this population.

Method

Participants

Two high school student samples were recruited for the study. The first consisted of 65 students who had bilateral, sensorineural hearing losses. Five of these students (8%) had a hearing loss classified, according to Australian Hearing (2004) categories, as mild (21-45dB), 13 (20%) were classified as moderate (46-60 dB), 24 (37%) as moderately severe (61-75 dB), 10 (15%) as severe (76-90 dB) and 13 (20%) as profound (>90 dB). Fifty-five students (85%) made use of hearing aids, 8 (12%) had received a cochlear implant, and 19 (29%) utilised an FM system. No students had additional educationally significant conditions or disabilities. There were 36 (55%) females and 29 (45%) males, who had a mean age of 16.58 years ($SD = .88$; range = 14.8-18.3). Twenty-three students (35%) were attending Grade 10, 21 (32%) Grade 11, and 21 (32%) Grade 12. Thirty-one students (47.7%) reported having part-time work experience.

The second, comparison, sample consisted of 107 normally hearing students from one high school. There were 50 (46.7%) females and 57 (53.3%) males, with a mean age of 16.04 years ($SD = .90$; range = 14.5-19.0). Forty-six students (43%) were attending Grade 10, 38 (35.5%) Grade 11, and 23 (21.5%) Grade 12. Seventy-two students (67.3%) reported having part-time work experience.

Measures

Career Maturity. The Australian short form of the Career Development Inventory (Creed & Patton, 2004) was used to measure career maturity. The original Career Development Inventory (Thompson et al., 1981) was designed to measure the attitudinal and cognitive dimensions of career maturity proposed by Super (1955) and Crites (1971). The full 72-item Australian version (Lokan, 1984) was modified to include Australian terminology, spelling, information sources and occupational conditions. The shortened version contains 33 items and, like the full version, measures four aspects of career maturity: Career Planning (extent of thinking and planning about career activities – Sample item, “How much time and thought have

you given to choosing a career in general?”), Career Exploration (willingness and ability to find and use career resources for planning – Sample item, “To which of the following sources would you go for information or help in making your plans for work or further education: careers teachers, careers advisors, or school counsellors?”), World of Work Information (knowledge of the world of work – Sample item, “You are most likely to be happy in a job when you: are being paid well/ know what you want from a job and get it/have interesting things to do when your day’s work is done/receive promotions and pay increases”) and Career Decision Making (ability to apply decision-making principles to the career choice process – Shortened sample item, “Alex might like to become a computer programmer, but knows little about this job. The most important thing for Alex to find out about at this stage is: what the work is and what you do on the job/what the pay is/what the hours of work are/where you can get the right training”). The Career Planning and Career Exploration subscales can be combined to give a composite Career Development Attitude score, while the World of Work Information and Career Decision Making subscales can be combined into a composite Career Development Knowledge score. The two composite scales are reported in the present study; higher scores reflect stronger attitudes and more knowledge, respectively.

Sound psychometric properties are reported in the manual (Lokan, 1984) for the full Australian version. Creed and Patton (2004) provide acceptable initial validity data based on factor analyses and associations with other career variables, and report internal reliability coefficients of .87 for the Career Development Attitude composite and .82 for the Career Development Knowledge composite for a large mixed sample of Grade 8-12 high school students. The corresponding internal reliability coefficients for the present study based on the full sample of 172 students were .84 and .80.

Career Indecision: The Career Decision Scale (Osipow, 1987) is a widely used measure of career decision status. It contains 16 items that measure career indecision (sample item, “Several careers have equal appeal to me. I’m having a difficult time deciding among them”), and 2 items that indicate the respondent’s degree of certainty about having made a career decision (Sample item, “I have decided on a career and feel comfortable with it. I also know how to go about implementing my choice”). There is one open-ended question that allows respondents to express their concerns in

their own words, which was not included in this study. In the present study higher scores indicate greater decidedness and more uncertainty, respectively. Internal reliability coefficients have been reported in the .80 range (Hartman, Fuqua, & Hartman, 1983). For the present study's sample, these were .72 for Certainty and .85 for Indecision. Concurrent (Hartman & Hartman, 1982), construct (Hartman et al., 1983) and predictive (Hartman, Fuqua, Blum, & Hartman, 1985) validity have all been adequately demonstrated for the scale.

Career Decision-Making Self-efficacy, Outcome expectations and Goals. Students completed the Middle School Self-Efficacy Scale (Fouad, Smith, & Enochs, 1997), which was designed to measure the three SCCT variables of career decision-making self-efficacy, outcome expectations and goals. The 12-item Career Decision-Making Self-efficacy scale is a modified version of the 50-item Career Decision-Making Self-Efficacy Scale (Taylor & Betz, 1983) that was originally validated on U.S. university students. Students are asked about their level of confidence in performing tasks related to career decision-making (Shortened sample item, "To what extent do you agree that you can find information in the library about occupations you are interested in?").

The five-item Outcome Expectations scale asks students about the relevance of performing career decision-making tasks in relation to the success of future career decisions (Sample item, "If I know about the education I need for different careers, I will make a better career decision"). The five-item goals scale asks students about career decision-making intentions and goals (Sample item, "I plan to talk to lots of people about careers"). Fouad et al. (1997) reported acceptable reliability coefficients for each of the subscales (.79 for self-efficacy, .70 for outcome expectations, .74 for goals), and provided evidence for construct validity. In the present study, the internal reliability coefficients were .75, .69 and .65 respectively. Higher scores indicate more of a particular construct.

Career Barriers. Students completed a Career Barriers scale. This was modified from McWhirter's (1997) 24-item Perception of Barriers scale (designed for use with high school students) and Luzzo and McWhirter's (2001) 32-item barriers' scale (designed for university students). Students were asked, "How much do you think that these

things will be a problem or barrier in following your educational and career goals”, about a series of 13 items, including “my gender”, “people’s attitudes about my gender”, “not having enough confidence”, “family difficulties” and “money difficulties”. To tap into potential barriers specific to young people with a hearing loss, six hearing-related items were added for the hard of hearing group. The choice of these items was informed by the literature and preliminary interviews conducted with students with hearing loss. The additional items were “talking and listening to new people”, “having to work in groups”, “my hearing loss”, “people’s attitudes about my hearing loss”, “people not understanding my hearing loss”, and “not being able to hear well on the phone”. Higher scores indicate the barriers will be less of a problem. The internal reliability for the Career Barriers scale was .82, and for the Hearing Barriers was .84.

Demographic information: All students were asked to report their age, gender, school year, whether they had had paid work, socioeconomic status (based on parents’ occupational level) and their typical academic achievement level (low achievement/satisfactory achievement/high achievement/very high achievement). Hard of hearing students were asked about their level of hearing loss (mild, moderate, moderately severe, severe, or profound) and their use of assistive hearing devices.

Procedure

For the hard of hearing sample, the relevant government and independent educational authorities supplied mailing lists of itinerant support teachers of the deaf throughout Queensland and New South Wales, Australia. All of these teachers were contacted, provided with details of the study, and asked to reply with the names of schools that enrolled students they were supporting who fitted the study criteria. This resulted in 110 schools being identified as having suitable students. After permission to approach these students was granted by the schools’ principals, copies of the survey instrument, along with information letters and consent forms for parents and students, were mailed to the support teachers, who were asked to give them to their students during their next support visit. Students were able to complete their survey at school or at home, then return it in a pre-paid return-address envelope that was provided. Five to seven weeks after distributing the surveys, follow-up telephone calls were made to the

teachers whose students had not returned the surveys. The itinerant support teachers identified a possible 126 students who met the study's criteria, and this number of surveys was sent out to the support teachers. Sixty-seven questionnaires were returned. Two of these were incomplete and could not be included in the analysis. Thus, the sample consisted of 65 students, a return rate of 51.6%.

The normally hearing sample was recruited from one government high school in south-east Queensland. The school can be considered representative of coeducational secondary schools situated in suburban Australia. It was in a middle socioeconomic area and, typical for Australia, did not contain substantial numbers of students from minority ethnic backgrounds. All students in Years 10-12 with parental and own consent completed the survey, which was administered by the first-named author in class time. Of the 135 surveys distributed, 28 were unusable as they were inadequately completed.

Results

Comparison Between Hard of Hearing and Normally Hearing Students

The first analysis was to test for differences between the hard of hearing and normally hearing groups on the career-related variables. To ensure that such a comparison was meaningful, a stratified, random sample of 65 normally hearing students was selected from the original sample of 107 to enable a group matched on demographic and social variables (age, gender, school achievement level and SES) to be created. These two matched groups were then tested for differences on the career-related variables of career development attitude, career development knowledge, career barriers, career decision making - certainty, career decision making - indecision, CDMSE, outcome expectations and goals using a MANOVA. Table 1 presents summary data for these two samples. A significant multivariate effect was identified for the MANOVA, $F(8, 120) = 4.20, p < .001$. At the univariate level, a significant difference ($p < .006$, i.e., a Bonferroni correction of $.05/8$) was identified for career development knowledge ($p < .001$), with the hard of hearing group reporting higher levels than the normally hearing group. Trend differences were also identified for career barriers ($p < .05$) and outcome expectations ($p < .01$), with the hard of hearing group reporting fewer barriers and having higher outcome expectations.

Insert Table 1 about here

Predicting Goals and Career Behaviours

Standard multiple regression analyses were utilised to test the relationship among the career-related and contextual variables for the total, hard of hearing and normally hearing samples. In the first series of analyses, goals was used as the dependent variable (DV), and the career-related variables (CCMSE and outcome expectations) and contextual variables (age, gender, group, paid work experience, parent's occupational level, academic achievement level, career barriers, and hearing-related barriers and hearing loss level for the hard of hearing sample only) were considered as the independent variables (IVs), and were included when significantly associated with the DV.

In the second series of analyses, three DVs were tested (career development attitude, career development knowledge, career indecision), and, when significantly associated with the DVs, the career-related variables (CDMSE, outcome expectations and goals) and contextual variables (age, gender, group, paid work experience, parent's occupational level, academic achievement level, career barriers, and hearing-related barriers and hearing loss level for hard of hearing sample only) were included as IVs. Dummy variables were created for gender (base level = female), paid work experience (base level = no paid-work experience), and group (base level = hard of hearing group). Table 2 reports the bivariate correlations for the total sample ($n = 172$). Table 3 reports the bivariate correlations for the hard of hearing ($n = 65$) and normally hearing students individually ($n = 107$). These tables demonstrated first, that there was no multicollinearity or singularity among the variables, and second, that the dependent variables were significantly associated with a number of the predictor variables, notably self-efficacy and outcome expectations, and as such indicated that the variables were suitable for including in the regression analyses (Tabachnik & Fidell, 1996).

Insert Tables 2 and 3 about here

To predict goals in the total sample, CDMSE and outcome expectations were used as IVs. For the normally hearing group, CDMSE, outcome expectations, age and gender were used as IVs. For the hard of hearing group, CDMSE and outcome expectations were used as IVs. For the total sample, the results indicate that together the IVs accounted for a significant 29.1% of the variance in goals, $F(2, 169) = 34.67$, $p < .001$, with outcome expectations the only significant individual predictor ($\beta = .48$; contributing 17.31% of the variance; $p < .001$). For the normally hearing sample, the variables accounted for a significant 29.5% in goals, $F(4, 97) = 10.13$, $p < .001$, with outcome expectations the only significant individual predictor ($\beta = .47$; 15.21%; $p < .001$). For the hard of hearing sample, the variables accounted for a significant 27.5% of the variance in goals, $F(2, 62) = 11.74$, $p < .001$, with outcome expectations ($\beta = .44$; 18.49%; $p < .001$) the only significant individual predictor. The results of these analyses are reported in Table 4.

Insert Table 4 about here

To predict career development attitude in the total sample, goals, CDMSE, outcome expectations, gender, school achievement and career barriers were used as the IVs. For the normally hearing group, goals, CDMSE, outcome expectations and career barriers were used as the IVs. For the hard of hearing group, goals, CDMSE, outcome expectations, gender and hearing barriers were used as the IVs. For the total sample, the results indicated that together the variables accounted for a significant 22.9% of the variance in career development attitude, $F(6, 161) = 7.99$, $p < .001$. The most important predictors, in order of importance, were CDMSE ($\beta = .25$; 6.90%; $p = .003$) and goals ($\beta = .24$; 4.88%; $p = .005$). For the normally hearing sample, the variables accounted for a significant 25.3% of the variance, $F(4, 102) = 8.64$, $p < .001$. The significant individual predictors were goals ($\beta = .27$; 6.30%; $p = .01$), career barriers ($\beta = .22$; 5.34%; $p = .19$) and CDMSE ($\beta = .24$; 5.02%; $p = .02$). For the hard of hearing sample, the variables accounted for a significant 37.3% of the variance, $F(5, 58) = 6.89$, $p < .001$. The most important predictors, in order of importance, were gender ($\beta = -.38$; 12.82%; $p = .001$; being female associated with higher career development attitude), and hearing barriers, ($\beta = .25$; 4.33%; $p = .050$). The results of these analyses are reported in Table 4.

To predict career development knowledge in the total sample, goals, CDMSE, outcome expectations, gender, school achievement, career barriers and group were used as IVs. For the normally hearing group, goals, CDMSE, outcome expectations, age, gender, school achievement and career barriers were used as IVs. For the hard of hearing group, goals, CDMSE, parental occupation and school achievement were used as IVs. For the total sample, the variables accounted for a significant 32.5% of the variance in career development knowledge, $F(7, 161) = 11.07, p < .001$. The most important predictors, in order of importance, were gender ($\beta = -.25; 7.90%; p < .001$; being female associated with more knowledge), school achievement, ($\beta = -.20; 4.97%; p = .004$), Group ($\beta = -.20; 4.62%; p = .006$; being hard of hearing associated with more knowledge) and career barriers ($\beta = .15; 2.46%; p = .045$). For the normally hearing sample, the variables accounted for a significant 38.2% of the variance, $F(7, 94) = 8.31, p < .001$. The important predictors, in order of importance, were gender ($\beta = -.31; 8.29%; p = .001$; being female associated with more knowledge), school achievement ($\beta = -.20; 3.28%; p = .028$), and age ($\beta = -.18; 2.59%; p = .049$). For the hard of hearing sample, the variables accounted for a significant 22.6% of the variance, $F(4, 51) = 3.72, p = .01$. The only significant individual predictor was school achievement ($\beta = -.33; 8.35%; p = .023$). The results of these analyses are reported in Table 4.

To predict career indecision in the total sample, CDMSE and career barriers were used as the IVs. For the normally hearing group, CDMSE, outcome expectations, age and career barriers were used as the IVs. For the hard of hearing group, no IVs were significantly associated with career indecision, indicating that these variables could not be used as IVs to predict it. For the total sample, the variables accounted for a significant 25% of the variance in career indecision, $F(2, 168) = 28.02, p < .001$. Both career barriers ($\beta = .41; 16.32%; p < .001$) and CDMSE ($\beta = .18; 3.65%; p = .013$) were significant individual predictors. For the normally hearing sample, the variables accounted for a significant 39.6% of the variance, $F(4, 97) = 15.87, p < .001$. The two significant individual predictors were career barriers ($\beta = .51; 27.46%; p < .001$) and CDMSE ($\beta = .19; 4.00%; p = .048$). The results of these analyses are reported in Table 4.

Discussion

One aim of the study was to determine if hard of hearing fully mainstreamed students differed from their normally hearing peers in levels of career maturity. The only significant difference found was on career development knowledge, for which the hard of hearing group reported significantly higher levels than the normally hearing group. On career development attitude, no significant difference was found between the two groups. Thus, in the extent of their thinking and planning about career-related activities, and their willingness and ability to find and use good resources for career planning, these hard of hearing students showed no difference from their normally hearing peers; in the extent of their knowledge of the world of work and their ability to apply decision-making principles and methods to their career choice process, they exceeded this sample of normally hearing peers. This result differs from the findings of Furlonger's (1998) study, which, using the longer version of the Career Development Inventory (Lokan, 1984), found significantly lower scores on the Career Development Knowledge composite scale and on the Career Planning subscale of the Career Development Attitude composite scale for a group of 26 deaf and hard of hearing high school students, compared to their normally hearing peers. Furlonger's sample differed from that of the present study as it consisted of students who attended a special education resource class and largely used a sign language in their communication.

The current findings reflect those of King (1990a, 1990b, 1992), who found no difference between her sample of 71 deaf and hard of hearing Grade 10 students and a comparison group of 318 normally hearing peers on the Career Development Attitude scale of the original American version of the Career Development Inventory (Thompson et al., 1981). King's sample also differed from the sample in the current study, with the majority of the deaf and hard of hearing students having a profound hearing loss and attending residential schools for the deaf. King's study did not utilize the Career Development Knowledge scale and so cannot be compared to the present study on this cognitive dimension of career maturity.

No differences were found between the matched hard of hearing and normally hearing groups on the career maturity-related variables of CDMSE, goals, career decision making – indecision, or career decision making – certainty. A trend towards outcome expectations was found, with the hard of hearing group indicating a stronger

belief in the beneficial results of career exploration activities than their normally hearing peers. As none of these variables has previously been investigated for deaf or hard of hearing adolescents, no comparison can be made with reports in the literature.

Thus, this study's results did not support the expectation that hard of hearing students would lag behind their normally hearing peers on measures of career maturity. A possible explanation for these findings is that, in their mainstreamed setting, these hard of hearing students were as exposed to, and had received a similar benefit from, career education and career development influences as other students. It would be particularly pleasing if part of the explanation of the finding of higher career development knowledge was because school personnel, such as guidance counsellors or itinerant support teachers, had provided extra assistance in career development to the hard of hearing students. Similarly, it is possible that the hard of hearing students' parents, perceiving their hard of hearing children to have extra needs in this area, had engaged in more discussion and other career development-related activities with these students than had parents of the normally hearing students with their children. Additional research is needed to investigate these possibilities.

In comparing the perceptions of career barriers rated by the two groups of students, it is perhaps surprising that the normally hearing sample reported a trend towards more perception of barriers than the hard of hearing students. It is possible that the hard of hearing students perceived these generic barriers to be less threatening than potential barriers associated with their hearing loss, and consequently reported a lower perception of them than the normally hearing group. No previous studies have reported the career barriers which may be perceived by young people with hearing loss.

A further aim of the study was to test the relationship among the SCCT variables for the population of adolescents with hearing loss, and to determine whether this relationship differed from that for adolescents without hearing loss. The multiple regression analyses found that outcome expectations was a clear individual predictor of goals in all three of the groups (total, normally hearing and hard of hearing), whereas CDMSE did not make a significant individual contribution in any of the groups. For the hard of hearing group, outcome expectations was the only important predictor of goals. However, as the SCCT model proposes that self-efficacy can influence goals indirectly via outcome expectations, individuals are likely to

anticipate positive outcomes from performing activities in which they believe themselves to be efficacious (Bandura, 1997). The bivariate correlation analysis showed CDMSE to be significantly associated with outcome expectations across all three groups. These findings reflect those of Betz and Voyten (1997) in their study of these SCCT variables among university students. In the present study, these results indicate that outcome expectations and CDMSE were important in goal-setting for the hard of hearing group, as they were for the normally-hearing group.

The effects of the SCCT variables (CDMSE, outcome expectations, and goals) on career behaviours were also tested in the regression analyses. Career behaviours can be defined as actions taken that are likely to contribute to career development and decision-making. In this analysis, career development attitude, career development knowledge and career indecision were considered to indicate career behaviours.

Consistent with the SCCT model, goals was a significant individual predictor of career development attitude in the total and normally hearing groups. The SCCT model posits that CDMSE and outcome expectations may also directly affect career behaviours, and these results indicated that CDMSE directly predicted career development attitude in the total and normally hearing groups. outcome expectations was not identified as a significant individual predictor of career development attitudes for any of the groups, but its strong predictive effect on goals, which influenced career development attitude in the total and normally hearing groups, gives further support for the SCCT model. These findings support previous research findings of significant relationships between CDMSE and the attitudinal component of career maturity in high school students (Anderson & Brown, 1997; Creed & Patton, 2003) and university students (Betz & Voyten, 1997; Luzzo, 1993, 1995).

For the hard of hearing sample, however, no SCCT variables were found to be influential. Gender (being female was predictive of higher career development attitude) and hearing-related barriers (less perception of hearing-related barriers was predictive of higher career development attitude) were the significant variables for this group. Thus, it seems that students who believed that their hearing loss presented strong barriers to their career efforts were less likely to be active in career exploration and planning than those who had a lower perception of such barriers. Low scores on career development attitude is particularly associated with the males in the hard of hearing sample, indicating that hard of hearing boys are more disadvantaged than hard

of hearing girls in developing sound career development attitudes towards thinking about, planning for, and seeking out information related to careers.

In predicting career development knowledge, none of the SCCT model variables was influential for any of the groups. For the total and normally hearing groups, gender was a significant predictor, with females indicating more career development knowledge than males. This is consistent with the findings of other studies (e.g., King, 1989; Patton & Creed, 2001) and can be expected; it is perhaps surprising, however, that the same effect was not indicated for the hard of hearing group, especially given that females showed higher career development attitude than males in the hard of hearing group. School achievement was predictive of career development knowledge for all three groups. Given that the career development knowledge composite scale represents the cognitive aspect of career maturity, this finding is unsurprising, and reflects other reports in the literature (Luzzo, 1993). It is nevertheless a matter of concern that those who have less ability are disadvantaged in obtaining the knowledge they need for making effective career decisions, and this is an area that should be particularly addressed with hard of hearing students.

Career indecision was found to be significantly predicted by CDMSE in the total and normally hearing groups; similar relationships between CDMSE and career indecision have been reported frequently in the literature (e.g., Betz & Voyten, 1997; Taylor & Betz, 1983; Taylor & Popma, 1990). However, no independent variables were found to be significantly associated with career indecision among the students with hearing loss. Further investigation of other factors that may be associated with career indecision in this population is warranted.

Several practical implications can be drawn from this study's findings. The finding that career decision-making goals were predicted directly by outcome expectations and indirectly, via outcome expectations, by CDMSE suggests the importance of encouraging hard of hearing adolescents' confidence in exploring, planning and making decisions about their occupational future, and developing and maintaining their optimism about the outcomes of these explorations and decisions, in the same way as for adolescents without hearing loss. However, overall, the results indicated that the SCCT variables were less influential in the career behaviours of the hard of hearing students than the normally hearing students, suggesting that variables other than those of the SCCT model need to be addressed with hard of hearing youth.

The finding that their perception of barriers related to their hearing loss had a significant negative effect on their career maturity and decision-making behaviours of the hard of hearing students suggests that interventions for hard of hearing students should focus on helping them address hearing-related issues. The results support suggestions made by Punch et al. (2004) for interventions for this population designed specifically to address concerns they may have and barriers they may face that are related to their hearing loss. The special issues facing hard of hearing boys in relation to career development attitudes also need to be addressed.

As with most of the research conducted with deaf and hard of hearing people, the sample size for the hard of hearing group in this study was relatively low. The sample size of 65 may have diminished the power of the regression analyses for this group compared to the larger sample sizes of the normally hearing group ($n = 107$) and the total sample ($n = 172$). A replication on a larger sample is desirable, but not necessarily achievable in Australia within the current levels of prevalence of significant hearing loss and given the difficulties of identification and recruitment of samples among this low-incidence population (Byrnes & Sigafos, 2001; Meadow-Orlans, 2001).

In summary, this study's findings reveal an encouraging picture of the career maturity levels of students attending regular schools with itinerant teacher support, in that these levels do not fall below those of students without hearing loss. Further, the results elucidate the need for additional research to investigate other factors that may be influential in the career development of this population. Finally, the study has indicated that perceived hearing-related barriers constitute an important area that needs to be further explored and addressed in order to aid adolescents with hearing loss through their career development process and school-to-work transition.

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Table 1
Summary data for hard of hearing group, stratified random sample of normally hearing group, total normally hearing group, and total sample.

Variables	hard of hearing			Random Sample normally hearing			total Sample normally hearing			total Sample		
	N ^a	M	SD	N	M	SD	N	M	SD	N	M	SD
Career Development Attitude	64	49.27	10.18	65	52.68	9.45	107	51.48	9.32	171	50.65	9.68
Career Development Knowledge	65	11.52	3.18	65	9.17	3.68	107	9.61	3.47	172	10.33	3.48
Career Decision Making – Certainty	64	5.05	1.56	65	4.85	1.57	107	5.12	1.58	171	5.09	1.57
Career Decision Making – Indecision	64	49.44	7.74	65	49.03	8.35	107	48.16	8.49	171	48.64	8.21
Career barriers	65	38.62	4.83	65	36.37	5.78	107	36.19	5.74	172	37.10	5.53
Career Decision Making Self-Efficacy	65	35.26	4.08	65	33.71	4.89	107	33.62	4.62	172	34.24	4.48
Outcome expectations	65	15.77	2.40	65	14.69	2.31	107	14.55	2.34	172	15.01	2.43
Goals	65	14.54	2.14	65	14.09	2.39	107	13.92	2.26	172	14.15	2.23

Note: ^a = sample size differs as one hard-of-hearing student did not complete all scales

Table 2
Bivariate correlations for total sample of hard of hearing and normally hearing combined (N = 172)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Career Development Attitude	-	.11	.39***	.32***	.37***	.23**	-.02	-.18*	.15	.08	-.17*	.26**	.11
2. Career Development Knowledge		-	.30***	.30***	.29***	.33**	-.12	-.32***	-.01	.10	-.25**	.30***	-.27***
3. Career Indecision			-	.12	.32***	.10	-.12	-.10	-.02	-.11	-.01	.47***	-.08
4. goals				-	.34***	.53***	-.08	-.12	-.03	.04	.04	.14	-.14
5. Career Decision Making Self-Efficacy					-	.50***	-.11	-.09	-.05	.12	-.06	.35***	-.18*
6. outcome expectations						-	-.09	-.03	-.08	.04	.01	.18*	-.24**
7. age							-	.01	.18*	.07	.11	-.10	-.28***
8. gender								-	.01	-.00	.20*	.02	-.08
9. Paid Work Experience									-	.02	-.10	-.03	.19*
10. parental occupation										-	-.19*	.00	-.15
11. school achievement											-	-.21**	-.16*
12. career barriers												-	-.21**
13. Group													-

Note: * = $p < .05$, ** = $p < .01$, *** = $p < .001$

Note: * = $p < .05$, ** = $p < .01$, *** = $p < .001$

Table 4: Summary of Multiple Regression Analyses predicting goals, Career Development Attitude, Career Development Knowledge and Career Indecision for the total ($N = 171$), normally hearing ($N = 107$) and hard of hearing ($N = 64$) groups.

hearing Group Variable	hard of hearing Group			total Group			normally					
	β	SEB	sr	β	SEB	sr	β	SEB	sr			
<i>Predicting goals</i>												
$(R^2 = .28, \text{Adjusted } R^2 = .25).$												
Career Decision Making Self-Efficacy	.06	.08	.15	.44	.07	.48***	.42	.46	.10	.03	.05	
outcome expectations	.47***	.42	.40	.11	.44***	.43						
age	.04	-.04	--	--	--	--	--	--	--	-.09	.23	
gender	.11	-.13	--	--	--	--	--	--	--	-.50	.40	
<i>Predicting Career Development Attitude</i>												
$(R^2 = .29, \text{Adjusted } R^2 = .31)$												
goals	.27*	.25	.81	.58	.17	.14	1.04	.36	.24**	.19	1.10	.42
Career Decision Making Self-Efficacy	.24*	.22	.44	.35	.18	.13	.55	.18	.25**	.20	.49	.21
outcome expectations	-.03	.85	.58	.20	.15	.15	-.25	.36	-.06	-.06	-.16	.45
career barriers	.22*	.23	--	--	--	--	.22	.13	.12	.13	.35	.15
gender	--	--	-7.73	2.24	-.38**	-.36	-2.36	1.38	-.12	-.12	--	--
school achievement	--	--	--	--	--	--	-1.67	1.02	-.12	-.12	--	--
Hearing Barriers	--	--	.86	.43	.25*	.21	--	--	--	--	--	--

<i>Predicting Career Development Knowledge</i>		<i>(R² = .23, Adjusted R² = .17)</i>		<i>(R² = .33, Adjusted R² = .30)</i>		<i>(R² = .38, Adjusted R² = .17)</i>	
goals	.06	.18	.13	.12	.13	.13	.15
Career Decision Making Self-Efficacy	-.01	.12	.14	.10	.06	.03	.07
outcome expectations	.13	-.01	.12	.23	.12	.16	.15
gender	-.31**	-.29	-.29	-.29	-.172	.47	-.25***
school achievement	.20*	-.18	-1.34	.57	-.33*	-.30	-.22
career barriers	.16	.14	-.09	.09	.05	.15*	.16
Group	-.18*	-.16	-.139	.50	-.20**	-.22	-.22
age	-.18*	-.16	-.139	.50	-.20**	-.22	-.22
parental occupation	-.19*	.20	-.19*	.18*	.19	.18*	.19
<i>Predicting Career Indecision</i>		<i>(R² = .25, Adjusted R² = .24)</i>		<i>(R² = .25, Adjusted R² = .24)</i>		<i>(R² = .40, Adjusted R² = .37)</i>	
parental occupation	.27	.45	.08	.07	.33	.13	.36
Career Decision Making Self-Efficacy	.19*	.20	-.19*	.18*	.19	.18*	.18
career barriers	.51***	.52	-.51***	.40	.61	.11	.41***
outcome expectations	.01	-.01	-.01	-.01	-.01	-.01	-.01
age	.09	-.10	-.09	-.09	-.09	-.09	-.09

NNNote: * = p < .05; ** = p < .01; *** =

p < .001