MULTIDIMENSIONAL PROPERTIES OF THE LOT-R: EFFECTS OF OPTIMISM AND PESSIMISM ON CAREER AND WELLBEING RELATED VARIABLES IN ADOLESCENTS

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EFFECTS OF OPTIMISM AND PESSIMISM ON CAREER AND WELLBEING

RELATED VARIABLES IN ADOLESCENTS

Abstract

The Life Orientation Test – Revised (Scheier, Carver & Bridges, 1994), measures of career maturity, career decision-making, career goals and wellbeing were administered to 504 high school students. Exploratory and confirmatory factor analyses demonstrated bi-dimensionality rather than unidimensionality for the LOT-R, with the two factors of optimism and pessimism being largely unrelated. Those with high optimism reported high levels of career planning and exploration, were more confident about their career decisions, and had more career related goals. Those with high pessimism reported low levels of career and decision making knowledge, were more career indecisive and reported low levels of school achievement. For wellbeing, those with high levels of optimism reported high levels of self-esteem and low levels of psychological distress, while those with high levels of pessimism reported low levels of self-esteem and more psychological distress.

Positive Psychology has received renewed interest by researchers over the past decade. Of particular focus has been the area of optimism, recognised as a generalised tendency to expect positive outcomes or the belief that "good rather than bad things will happen in a person's life" (Scheier & Carver, 1993, p.26). Optimism performs a self-regulatory function in determining whether an individual will initiate or maintain working toward desired goals. Carver and Scheier (1981, 1982) have described this process within their Control Theory. This theory postulates that as long as an individual's expectancies of eventual success are sufficiently favourable they are likely to remain engaged in efforts to reach desired goals despite adversities that may arise. However, when an individual's doubts become too severe, they are more likely to give up on their goals in the face of adversity. These alternative facets represent optimism and pessimism respectively. The differences in an individual's expectancies are assumed to correspond with variations in their affect. For example, when an individual attains sufficient movement toward their desired goals their affect is positive. Yet, when movement is sufficiently impeded the individual experiences negative affect.

The most commonly utilised measure of optimism is the Life Orientation Test (LOT) developed by Scheier and Carver (1985). This scale contains eight items, four negatively and four positively phrased, which determines an individuals level of optimism. Recently, Scheier, Carver and Bridges (1994) modified the LOT as they found that two of the original positively phrased items were measuring an individual's method of coping rather than generalised expectancies. For the LOT-Revised (LOT-R) the two coping items were removed, an additional positively phrased item was included, and one negatively worded

item was not included in the scoring. To date, research investigating optimism has mainly utilised the original LOT incorporating the two coping items.

Over the past decade much confusion and controversy has arisen regarding the dimensionality of the LOT. Carver and Scheier have preferred the unidimensional view, that is, optimism and pessimism form polar opposites. This suggests that an individual can be either optimistic or pessimistic but cannot be both. It is their opinion that the two separate dimensions that do emerge in some studies probably reflect differences in item wording rather than content. Some research, however, indicates that this view may be inaccurate and that optimism can be better conceptualised as two partially independent dimensions on which an individual can score positively or negatively.

Numerous studies have provided evidence for a conceptualisation of optimism and pessimism as separate constructs (Chang, Maydue-Olivares & D'Zurilla, 1997; Lai, 1994; Mroczek, Spiro, Aldwyn, Ozer & Bosse, 1993). Specifically, Marshall, Wortman, Kusulas, Hervig and Vickers (1992) conducted exploratory and confirmatory factor analyses on the LOT and revealed that a two-factor model was superior when explaining optimism. They also found that optimism was predominantly related to extraversion and positive affect, whilst pessimism was principally associated with neuroticism and negative affect. The authors concluded that important information may be lost without separate measures for both optimism and pessimism. In a more recent study, Robinson-Whelen, Kim, MacCallum and Kiecolt-Glaser (1997) examined whether optimism or pessimism was a more important predictor of health and wellbeing among adults experiencing severe, chronic stressors than those who were not. Using factor analysis, they found, similar to Marshall et al. (1992), optimism and pessimism to be separate,

largely independent constructs. Further, they found that pessimism, but not optimism, was able to predict health and wellbeing, confirming that the two dimensions related to external variables in a different manner.

Further support for the bi-dimensionality of the LOT is associated with the low degree of relationship found between the two dimensions. For adult samples, Plomin et al. (1992) found that optimism and pessimism were uncorrelated. Mroczek et al. (1993) reported a moderate correlation (-.28). Dember, Martin, Hummer and Melton (1989) reported an average correlation of -.55 across two samples. Marshall, Wortman, Kuslas, Hervig and Vicers (1992) reported correlations of -.54 and -.47 in two young male samples. Both latter studies considered these correlations insufficient to warrant viewing optimism and pessimism as a single construct. Myers and Steed (1999) found optimism and pessimism to be moderately correlated (.50) in a sample of university students, and drew a similar conclusion. These low to moderate relationships argue that the constructs are relatively independent, and important information could be lost if not measured separately.

Researchers have identified that there is a greater degree of independence of the constructs in older adult samples than in younger samples. The studies that have found moderate correlations of .40 or greater have generally utilised younger populations (Dember et al. 1989; Marshall et al. 1992; Myers & Steed, 1999). A cognitive developmental view has been proposed to account for these findings. This perspective suggests that younger thinkers often "approach problems more dualistically and accept a more black versus white view of reality than older adults" (Labouvie-Viefi, 1992, cited in Robinson-Whelen et al. 1997, p. 1351).

In relation to the dimensionality of the LOT-Revised, Mehrabian and Ljunggren (1997) used both exploratory and confirmatory factor analysis techniques that yielded one factor. They found a correlation of -.56 (-.82 when corrected for attenuation) between the two dimensions, and concluded that this provided evidence for unidimensionality. Lai and Wong (1998), also used confirmatory factor analysis with a Hong Kong Chinese sample and found that their adapted version of the LOT-R (C-RLOT) was best represented by a one-factor model. On the other hand, Burke, Joyner, Czech and Wilson (2000) who contrasted the LOT-R with the Optimism/Pessimism Scale (OPS; Dember et al. 1989), demonstrated that the two scales were not measuring similar constructs and found only a modest correlation between LOT-R optimism and LOT-R pessimism (-.30), concluding that the two dimensions were relatively independent.

Adding support to the bi-dimensionality view of the LOT is the way that optimism and pessimism relate differently to external variables. Myers and Steed (1999) found that individuals who used repressive coping strategies (i.e., avoiding negative affect rather than seeking positive affect) scored higher than controls on pessimism, but had overlapping scores on optimism. Marshall et al. (1992) found pessimism to be correlated predominantly with neuroticism and negative affect. Robinson-Whelen et al. (1997) contrasted a sample of stressed home caregivers with non-caregiving residents and found that negative affectivity, anxiety and depression correlated more highly with optimism among the stressed adults. Further, these authors found that pessimism, but not optimism was a better predictor of psychological and physical health outcomes a year later.

Dispositional optimism has a future orientation in that it concerns an individual's generalised expectations. Research to date has primarily focused on its association with

outcomes for psychological and physical health issues, such as breast cancer (Carver et al., 1993), gay men at risk for AIDS (Taylor, Kemeny, Aspinwall, Schneider, Rodriguez, & Herbert, 1992), academic adjustment at university (Aspinwall & Taylor, 1992), coping (Scheier & Carver,1992; Carver, Scheier, & Weintraub, 1989; Harju, & Bolen, 1998; Myers & Steed, 1999), stress (Chang, 1998), and postpartum depression (Carver & Gaines, 1987). Studies to date have also largely focused on university and adult samples. There has been little research that has tested the dimensionality of the LOT with younger groups, nor has there been research that has examined the correlates of optimism and pessimism with external variables for this age group.

One area with a strong future focus is career decision making, where choices are made that strongly influence life directions and outcomes. Career issues are particularly salient for adolescent populations where young people need to be informed, skilled and confident to set future goals and make career related decisions. Important to this life transition from education to work are young peoples levels of career maturity, their career related decision-making abilities, and the clarity of their future occupational goals. Career maturity refers, broadly, to the individual's readiness to make informed, age-appropriate career decisions and cope with career development tasks (Savickas, 1989). Definitions include the individual's ability to make appropriate career choices, including awareness of what is required to make a career decision and the degree to which one's choices are both realistic and consistent over time (Levinson, Ohler, Caswell, & Kiewra, 1998). Crites' (1971) model of career maturity proposed that it consists of an affective dimension and a cognitive dimension. The cognitive dimension is composed of decision-making skills, and the affective dimension includes attitudes toward the career decision

making process. Only one investigation was identified that related specifically to career issues. Geers (2000) examined expectations regarding academic, health and external and future class grade outcomes in relation to optimism and pessimism (assessed by the LOT and OPS). Optimism and pessimism correlated differentially with these variables. Academic, health and external outcomes were associated with optimism, while future class grade was related to pessimism.

Based on the research reviewed thus far, the dimensionality of the LOT remains unclear, and there have been very few studies that have examined the factor structure of the revised LOT-R. Neither scale has been tested on adolescent samples, nor has the construct of optimism been examined in relation to career planning, where a future orientation is the primary focus. The present study will test the factor structure of the LOT-R on a sample of school-based adolescents, and examine the correlates of pessimism with well-utilised wellbeing variables and to newly examined variables of career maturity. Given previous research on the LOT it is expected that a two-factor model will better fit the data for the LOT-R, and that these two factors will only be moderately correlated. As with previous research it is also expected that these separate factors will correlate differently with measures of wellbeing. Lastly, given the future focus of career-related variables and their likely sensitivity to life orientation, it is also expected that the separate factors will correlate differently with these variables.

Method

Participants were 504 high school students attending Grades 8-12 at one Australian High School in southeastern Queensland. The school was suburban based in a medium sized city, and was established as middle level socioeconomic based on its location. There were no significant ethnic groupings, which reflected the broad cultural nature of the Australian population. Participants were drawn from a larger database (see Patton & Creed, 2001) and represented all students in these Grades who fully completed the survey form. Fifty-two percent of participants were female, ranging in age from 12.48-18.51 years ($\underline{M}$ = 14.96, $\underline{SD}$ = 1.52). There were 155 students from Grade 8, 61 from Grade 9, 125 from Grade 10, 88 from Grade 11, and 75 from Grade 12. On a self-report measure of School Achievement, 10.8% indicated they typically achieved less than a Satisfactory level at school (the six categories were < SA, SA, SA-HA, HA, HA-VHA and VHA, where SA = Satisfactory, HA = High Achievement and VHA = Very High Achievement), 11.3% indicated they typically achieved SA, 19.7% achieved between SA-HA, 23.4% achieved HA, 19.5% achieved between HA-VHA, and 15.4% achieved VHA.

Instruments

Optimism. The Life Orientation Test – Revised (LOT-R; Scheier, Carver, & Bridges, 1994) is a 10-item scale, with four filler items and six scale items. LOT-R Total scores are calculated by summing the three positively worded and three negatively worded items (these are reverse coded). Respondents are asked to indicate their level of agreement with

each of the items on a 4-point scale, using the response format, "strongly agree" to "strongly disagree". This gives a possible range of 6-24, with higher scores indicating more optimism. Scheier, Carver and Bridges report an internal reliability coefficient of .78 for an undergraduate sample. The corresponding internal reliability coefficient for the sample in the present study was .60. LOT-R Optimism (total of the three positively worded items) and LOT-R Pessimism (total of three negatively worded items) were also calculated. Internal reliability coefficients for these subscales were .62 (Optimism) and .78 (Pessimism).

Career Maturity. The Australian version of the Career Development Inventory (CDI-A; Lokan, 1984) has 72 items and is designed for students in Years 8-12. It measures several aspects of career development, including career planning orientation, awareness and use of resources, knowledge of the career development process, knowledge of the world of work, and knowledge and use of decision making principles. Four subscales and two composite scales were examined in this study. The four subscales were Career Planning (CP; 20 items), Career Exploration (CE; 16 items), World of Work Information (WW; 24 items), and Career Decision Making (DM; 12 items). The two composite scales were Career Development Attitude (CDA; CP and CE combined) and Career Development Knowledge (CDK; WW and DM combined). Adequate reliability and validity data are reported in the manual (Lokan), and represent similar psychometric properties to those reported for the American inventory (Pinkney & Bozik, 1994). Internal reliability coefficients calculated in the present study were .91 (CP), .77 (CE), .85 (WW), .74 (DM), .91 (CDA), and .89 (CDK).

Career Decision-Making. The Career Decision Scale (CDS; Osipow, 1987) consists of two subscales, the CDS-Indecision scale (16 items) that provides a measure of career indecision, and the CDS-Certainty scale (two items) that indicates the degree of certainty that the respondent feels in having made a career decision. Participants are asked to respond by indicating on a four-point scale whether the item was "not at all like me" through to "exactly like me". Higher scores on CDS-Indecision indicate greater indecision; higher scores on CDS-Certainty indicate greater certainty. Internal consistency coefficients have been consistently reported in the .80 range (Hartman, Fuqua & Hartman, 1983). Internal reliability co-efficients calculated in the present study were .90 for CDS-Indecision and .78 for CDS-Certainty. Concurrent validity (Hartman & Hartman, 1982), construct validity (Hartman et al., 1983) and predictive validity (Hartman, Fuqua, Blum & Hartman, 1985) have all been adequately demonstrated.

Career Goal Setting. A six-item scale (Mu, 1999) was used to measure the level of career related goal setting (CGS). The six items were, "I have a clear set of goals for my future; I know what I want to do in terms of an occupation or career; I believe my occupational/career goals are realistic; I believe I will be able to achieve my occupational/career goals; I am clear about the steps I need to take to achieve my occupational/career goals; I am taking the steps necessary to achieve my occupational/career goals". Respondents were asked to indicate their agreement with each item on a 5-point scale with end points of "strongly agree" to "strongly disagree". This gave a possible range of 6-30, with higher scores representing more career related goal setting. Mu reported an internal reliability of .92 with his sample of high school students. The internal reliability coefficient in the present study was .90.

Self-Esteem. The 10-item Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) was used to provide a measure of global evaluation of self worth. The RSE is the most widely used instrument for the measure of this construct (Blascovich & Tomaka, 1991). Participants are asked to respond by rating how strongly they agree with each statement on a four point scale, using anchors of "strongly agree" to "strongly disagree". Answers were scored from 1-4, giving a possible range of 10-40, with higher scores indicating higher self esteem. The internal reliability coefficient for this sample was .85.

Psychological Well-being. The 12-item version of the General Health Questionnaire (GHQ; Goldberg, 1972) was used to measure psychological distress. The 12-item version has been widely used and recommended for use as a screening device with young people (e.g., Winefield, Goldney, Winefield & Tiggemann, 1989). Respondents are asked to report on how they felt recently on a range of variables, including cognitive processing, self esteem, anxiety and depression (e.g., "Have you recently been able to concentrate on whatever you're doing?"). Responses were scored on a four point scale from zero to three using anchors such as "better than usual/same as usual/less than usual/much more than usual". Scores were totalled to produce global ratings with a range of 0-36. Higher scores indicated more psychological distress. The internal reliability coefficient for this sample was .87.

Procedure

Survey forms containing the six scales (LOT-R, CDI-A, CDS, CGS, RSE, GHQ-12) and asking questions about age, gender and school achievement were administered to all

students in Grades 8-12 in the secondary school that participated in the study. The classroom teachers who had been provided with instructions regarding the administration protocol administered the survey forms.

The total sample utilised in the study was 504 student participants. In order to test the hypothesised dimensionality of the LOT-R, this sample was randomly split into two separate groups. These groups were then compared to determine if any bias resulted from the process of the split. One resultant group was then subjected to an exploratory factor analysis (principal-axis factor analysis with varimax rotation), and the second group was subjected to two confirmatory factor analyses (Amos: Arbuckle & Wothke, 1995) to test for a single or two-factor model for the LOT-R. A series of cross-sectional analyses was then conducted to determine whether the LOT-R measures responded differently to a range of outside (demographic, career and wellbeing related) variables.

Results

Original Sample and Random Split

The original sample of 504 was randomly split into two subgroups of 253 and 251 study participants respectively. Chi-square and independent sample t-tests found no differences between the two groups on any of the demographic (age, gender), career or wellbeing related variable, indicating no manipulation bias. Summary data for the original sample and the two randomly split subgroups are reported in Table 1.

Table 1

Mean and standard deviation scores for the original and two random split subgroups, and t-values for tests of differences between the two random split subgroups.

	Total Sample			Random Group 1			Random Group 2			
	N[#]	M	SD	N[#]	M	SD	N[#]	M	SD	t
LOT-R										
LOT-R (Total)	504	16.47	2.88	253	16.43	2.77	251	16.51	2.98	-0.29
LOT-R (Pessimism)	504	7.47	2.14	253	7.55	2.13	251	7.38	2.14	0.88
LOT-R (Optimism)	504	8.94	1.81	253	8.98	1.78	251	8.89	1.85	0.57
Career Variables										
CDI-A (CDA)	500	98.79	18.79	252	100.10	17.94	248	97.47	19.57	1.56
CDI-A (CDK)	504	20.98	7.61	253	20.82	7.35	251	21.14	7.89	-0.47
CDI-A (CP)	501	60.86	13.21	243	61.78	12.52	248	59.92	13.84	1.58
CDI-A (CE)	503	38.01	7.67	252	38.31	7.46	251	37.71	7.89	0.88
CDI-A (WW)	504	14.97	5.28	253	14.86	5.12	251	15.09	5.43	-0.50
CDI-A (DM)	504	6.00	3.00	253	5.96	2.88	251	6.04	3.13	-0.31
CDS (CER)	502	5.56	1.67	253	5.68	1.57	249	5.44	1.76	1.60
CDS (IND)	494	33.95	10.31	251	34.03	10.41	243	33.86	10.24	0.18
CGS	498	23.04	5.61	250	23.26	5.17	248	22.81	6.02	0.90
School Achievement	462	6.65	1.78	228	6.66	1.80	234	6.65	1.77	0.08
Wellbeing Variables										
Self-Esteem	496	29.88	5.77	249	29.92	5.77	247	29.85	5.78	0.13
GHQ-12	500	11.62	6.40	250	11.56	6.49	250	11.67	6.33	-0.19
Demographic Variable										
AGE	504	14.96	1.52	253	14.96	1.57	251	14.96	1.47	-0.00

Note: [#] Sample sizes differ as not all participants completed all scales. Lot-R (Total) = total of 6-item LOT-R scale with higher scores representing higher levels of optimism; LOT-R (Pessimism) = total of 3-item Pessimism subscale of LOT-R with higher scores representing more pessimism; LOT-R (Optimism) = total of 3-item Optimism subscale of LOT-R with higher scores representing more optimism; CDI-A (CDA) = Career Development Attitude composite scale of the Career Development Inventory – Australia; CDI-A (CDK) = Career Development Knowledge composite scale of the CDI-A; CDI-A (CP) = Career Planning subscale of the CDI-A; CDI-A (CE) = Career Exploration subscale of the CDI-A; CDI-A (WW) = World of Work subscale of the CDI-A; CDI-A (DM) = Decision Making subscale of the CDI-A; CDS (CER) = Certainty subscale of the Career Decision Scale; CDS (IND) = Indecision subscale of the CDS; GS = 6-item Career Goal Setting scale; GHQ-12 = 12-item General Health Questionnaire.

Exploratory Factor Analysis of the LOT-R

To estimate the factor structure of the LOT-R, an exploratory factor analysis using principal axis factoring with an orthogonal (varimax) rotation was conducted on the random split subgroup Group 1. This analysis identified two factors accounting for 62.10% of the variance. This solution was factorially simple and interpretable, with three

items loading on Factor 1 (eigenvalue = 2.08, variance explained = 34.66; eigenvalues and % variance derived from initial principal axis factoring) and three items loading on Factor 2 (eigenvalue = 1.65, variance explained 27.44%). The items loading on Factor 1 were the three considered to represent Pessimism; the items loading on Factor 2 were the three considered to represent Optimism. These results support categorization of the LOT-R into two separate factors tapping Pessimism and Optimism. Factor loadings after rotation are reported in Table 2.

Table 2

Principal axis factor estimates of the orthogonal (varimax) factor loadings for the LOT-R; N = 253

Item	Factor 1	Factor 2
I rarely count on good things happening to me	*.81*	.04
I hardly ever expect things to go my way	*.74*	-.01
If something can go wrong for me, it will	*.63*	-.05
Overall, I expect more good things to happen to me than bad	.09	*.66*
I am always optimistic about my future	.05	*.61*
In uncertain times I usually expect the best	-.14	*.45*

Confirmatory Factor Analysis of the LOT-R

Confirmatory factor analysis (CFA) based on the 251 participants from the random split subgroup Group 2 was conducted using Amos Version 4.0 (Arbuckle & Wothke, 1995). In a CFA, an a priori structure is posited and the adequacy of how well the data fits this structure is tested. The purpose here was to evaluate the two competing interpretations reported for the factor structure of dispositional optimism (as measured by the LOT-R), that is, (Model 1) that the LOT-R is a unidimensional measure (e.g., Scheier & Carver, 1992), and (Model 2; which is consistent with the exploratory factor analysis results in the present study), that the LOT-R has a two factor structure. For Model 1, the six LOT-R items were allowed to load freely on a single latent factor representing Optimism. For Model 2, the three optimism items were allowed to load freely on a latent factor representing Optimism, and the three pessimism items were allowed to load freely on a latent factor representing Pessimism. The correlation between the two latent factors in Model 2 was freely estimated. Variances for all latent factors were fixed at unity to identify the models. Chi-square values and subjective indices of fit for the two analyses are reported in Table 3.

Table 3

Chi-square and goodness-of-fit indices for models of LOT-R; N = 251

Model	*df*	χ^2	GFI	AGFI	IFI	NFI	TLI	CFI	RMSEA	PCLOSE
1-Factor	9	115.29***	.86	.67	.69	.67	.48	.69	.22	.00
2-Factor	8	11.47	.99	.96	.99	.97	.98	.99	.04	.55

Note: GFI = Goodness of Fit, AGFI = Adjusted Goodness of Fit, IFI = Incremental Fit Index (Hair, Anderson, Tatham, & Black, 1995), NFI = Normed Fit Index (Bentler & Bonnet, 1980), TLI – Tucker-Lewis Index (Tucker & Lewis, 1973), CFI = Comparative Fit Index (Bentler, 1990), RMSEA = Root Mean Square Error of Approximation, PCLOSE = Probability of Close Fit (Browne & Cudeck, 1993), *** = $p < .001$.

Firstly, the results of the CFA analyses indicated that Model 2, the two factor model, was able to fit the data considerably better than Model 1, the one factor model. Secondly, the chi-square results and all of the subjective indices indicated that Model 2 was a good fit to the data, while the fit for Model 1 was less than acceptable. In the two factor model the correlation between the latent Pessimism and latent Optimism factors was .16, indicating little shared variance between the two variables. The evidence here with this adolescent sample is that the LOT-R reflects two largely uncorrelated latent factors that can be labelled Pessimism and Optimism.

Relationship with Career Related Variables

To test how the LOT-R measures of Optimism and Pessimism related to external variables, bivariate correlations were calculated between the LOT-R Optimism, LOT-R Pessimism, LOT-R Total and the career, wellbeing and demographic variables. Despite the LOT-R loading on the two factors of Optimism and Pessimism in this study, the LOT-R has been examined in other studies as a unidimensional construct. To allow for a contrast between the use of the factor scores (of Optimism and Pessimism) and the total score of the LOT-R, the LOT-R Total was also included in this correlational analysis (see Table 4).

For career maturity, small to moderate significant associations were found between the LOT-R Total and all CDI-A measures (CDA, CDK, CP, CE, WW, DM). The separate factor scores of LOT-R Optimism and LOT-R Pessimism, however, present a different

picture. Career Development Attitude (CDI-A CDA) was moderately positively correlated with LOT-R Optimism, such that higher levels of optimism were associated with more career planning and exploration, while there was no association between LOT-R Pessimism and Career Development Attitude. On the other hand, there was no association between LOT-R Optimism and Career Development Knowledge (CDI-A CDK), while LOT-R Pessimism was moderately negatively correlated with Career Development Knowledge, such that higher levels of pessimism were associated with lower levels of knowledge about the world of work and decision making strategies. This career maturity double dissociation is reflected in the subscales of the CDI-A (CP, CE, WW, and DM).

For career decision making, there was a small positive correlation between LOT-R Total and decision making certainty (CDS-CER). This masked a moderate positive correlation with LOT-R Optimism, such that higher levels of optimism were associated with more career decision making certainty, and no correlation with LOT-R Pessimism. Similarly, there was a moderate negative correlation between LOT-R Total and career indecision, which masked a moderate positive correlation with LOT-R Pessimism, and no correlation with LOT-R Optimism. Similarly, a modest positive association between LOT-R Total and career goal setting masked a moderate positive correlation with LOT-R Optimism and no correlation with LOT-R Pessimism. Lastly, for school achievement, a moderate correlation with LOT-R Total reflected a moderate negative association with LOT-R Pessimism, and no association with LOT-R Optimism. In summary, for the career related variables, those with high levels of optimism (LOT-R Optimism) reported high levels of career planning and exploration, were more decided about their career decisions,

and had more career related goals. Those with high levels of pessimism (LOT-R Pessimism) reported low levels of career and decision making knowledge, were more career indecisive, and reported low levels of school achievement.

For the wellbeing variables, more intuitive results are reported. Those with higher levels of optimism (LOT-R Optimism) reported higher levels of self-esteem and lower levels of psychological distress. Those with higher levels of pessimism (LOT-R Pessimism) reported lower levels of self-esteem and more psychological distress. Lastly, no associations were identified between optimism or pessimism and age.

Table 4
Pearson Product-Moment correlations between LOT-R Total, LOT-R Optimism, LOT-R Pessimism and Career, Wellbeing and Demographic variables; N = 504.

External Variable	LOT-R Total	LOT-R Optimism	LOT-R Pessimism
Career Variables			
CDI-A (CDA)	.20***	.24***	-.07
CDI-A (CDK)	.17***	-.02	-.25***
CDI-A (CP)	.20***	.26***	-.05
CDI-A (CE)	.15**	.15**	-.08
CDI-A (WW)	.14**	-.02	-.21***
CDI-A (DM)	.19***	-.02	-.27***
CDS (CER)	.14**	.26***	.03
CDS (IND)	-.24***	.01	.33***
CGS	.12**	.24***	.04
School Achievement	.20***	.06	-.22***
Wellbeing Variables			
Self-Esteem	.55***	.34***	-.45***
GHQ-12	-.38***	-.37***	.19***
Demographic Variable			
AGE	-.01	.01	.02

Note: Refer Table 1 for legend; ** = $p < .01$; *** = $p < .001$.

Discussion

The results of the current study support the hypothesis that optimism and pessimism, as measured by the LOT-R, are separate largely unrelated constructs as proposed by previous researchers who tested this hypothesis on adult samples (e.g., Chang et al. 1997; Marshall, et al. 1992; Robinson-Whelen, et al. 1997). The current results contribute to the present literature by demonstrating the bi-dimensionality of the LOT-R with an adolescent sample. Support for bi-dimensionality comes also from the weak correlation (.16) found between the constructs in the present study. This low relationship suggests there is very little shared variance between the two factors.

Previous research has found that there is a greater degree of independence between the constructs of optimism and pessimism in older adult samples (e.g., -.28; Mroczek et al. 1993) than younger adult samples (e.g., -.47 to −.54; Marshall et al.,1992). A cognitive developmental view has been presented to account for this finding, proposing that younger adults have a more black and white view of reality and approach problems more dualistically than older adults. The current study utilising an adolescent sample does not support this proposition or the developmental explanation for it. Robinson-Whelen et al. (1997) found that during times of chronic stress individuals tended to view the future dualistically, considering both positive and negative aspects. This implies that the immediate situation experienced by the individual rather than the developmental stage they are at might be the important feature associated with optimism and pessimism. There was no reason to suppose that the students in the present study were experiencing great stress or situations that might have impacted on optimism/pessimism in this way. It is

possible that this was the explanation for the low correlation between optimism and pessimism and needs to be explored in future research.

Further support for the bi-dimensionality nature of optimism comes from the way optimism and pessimism related to the external variables examined. Based on the future focus of optimism/pessimism in regard to expectations, this study examined the relationship between optimism and career-related variables (career maturity, decision-making and goals) which also have a future orientation and are a pertinent issue at this stage of adolescent development. It was predicted that the optimism and pessimism constructs would relate differently to the external career variables. It was shown that those with high levels of optimism demonstrated higher levels of career planning and exploration, were more decided about their career decisions, and had more career related goals. Conversely, those with higher levels of pessimism were depicted with lower levels of career and decision making knowledge, were more career indecisive and reported lower levels of school achievement. When examining these associations it was clear that the total LOT-R scores masked meaningful correlations between the career-related variables and the separate optimism and pessimism constructs. These findings emphasise the importance of investigating optimism and pessimism independently, as utilising the total score of the LOT-R does not present a clear picture of the relationships that are occurring between external variables and optimism/pessimism. These findings also indicate that optimism and pessimism may have a key role to play in adolescent career development and orientation. If positive expectations of the future for adolescents can be fostered then they will be more likely to demonstrate higher levels of career planning and exploration, be more confident about their career decisions and have more career related

goals. Thus, when developing interventions or programs that focus on career orientation in adolescents an important component will be to include methods to increase the participants' levels of optimism.

The validity of the career-related findings is enhanced as the results for the associations between optimism and pessimism and wellbeing (the stable self-esteem variable and the state-like psychological distress variable) are consistent with previous studies (Aspinwall & Taylor, 1992; Scheier & Carver, 1992). Those with higher levels of optimism reported higher levels of self-esteem and lower levels of psychological distress. Those with higher levels of pessimism reported lower levels of self-esteem and more psychological distress.

Researchers are beginning to recognise the importance of investigating the positive and negatives facets of optimism, affect, and cognition. The empirical evidence has revealed that positive and negative affect or cognitions, and likewise optimism, are not polar opposites as originally thought. The literature has demonstrated that individuals are capable of experiencing positive and negative facets of affect and cognition at the same time in varying degrees (Ito & Cacciopo, 1998). Accumulating evidence is also demonstrating that individuals can experience optimism and pessimism simultaneously in varying degrees (Burke et al., 2000; Chang et al., 1997; Marshall et al., 1992). The present study supported the conceptualisation of optimism and pessimism as separate constructs. The implication inherent in this finding is the importance of investigating optimism and pessimism independently when conducting further research in this area. Obtaining a single score for optimism is no longer appropriate, and it is recommended that two scores be obtained, one for optimism and one for pessimism.

Based on the present findings a number of areas require further examination. Research needs to examine the developmental paths of dispositional optimism and dispositional pessimism in general and specifically in relation to the development of career maturity variables for young people. Related to this, the importance of optimism/pessimism in determining an individual's career related activities and career path influences need to be examined. For example, how does optimism impact on study behaviour or obtaining work experience, and what are the mediating factors playing a role here? It is likely that optimism and pessimism research will prove a productive avenue to facilitate a better understanding of the career development of adolescents.

Limitations

There are a number of limitations that need to be considered for the current study. First, the external validity of the findings is restricted to the population utilised. Second, there are concerns about common method variance as self-report measures were the only form of assessment. In future, it would be useful to utilise a multi-modal approach (such as observation and interviews in conjunction with self-report measures). Third, correlational analyses were applied to understand the relationships between the various constructs. Future research would benefit by testing causal models on data collected over more than one occasion. Finally, the internal reliability of the total LOT-R Optimism subscale was quite low. The psychometric properties of the LOT-R should be examined further with adolescents to confirm the scale's applicability with this population.

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