**Measuring Assimilative and Accommodative Resources in Young Adults: Development
and Initial Validation of Suitable Scales**

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PAPER CAN BE CITED AS:

Haratsis, J., Creed, P. A., & Hood, M. (2015). Measuring assimilative and accommodative resources in young adults: Development and initial validation of suitable scales. *Personality and Individual Differences*, 81, 61-66. doi:10.1016/j.paid.2014.12.011

Abstract

New scales measuring assimilation and accommodation (cf. the dual-process framework) were developed for use with young adults. Experts reviewed 41 items which were then administered to 235 young adults ($M_{\text{age}} = 22$; 72% female). Exploratory factor analyses reduced these to two 10-item scales, which demonstrated high internal consistency ($\alpha > .90$). Confirmatory factor analysis using a second sample ($N = 236$, $M_{\text{age}} = 22$; 77% female) confirmed the proposed structure. Construct validity was supported by finding correlations in the expected directions with measures of goal engagement, disengagement, re-engagement, and life satisfaction. The new scales will allow assimilative and accommodative resources to be assessed in young people.

Keywords: assimilation; accommodation; dual-process framework; young adults

1.0 Introduction

The dual-process framework (Brandtstädter & Renner, 1990; Brandtstädter & Rothermund, 2002) has advanced our understanding of how people regulate their behaviour. According to this model, people monitor their behaviour and reduce discrepancies between their current and desired state by employing either assimilative or accommodative self-regulatory resources. These resources are considered somewhat trait-like, meaning that individuals are likely to preference one or the other; however, their use often varies depending on environmental demands and constraints. Existing measures of assimilation and accommodation were developed and validated for adults (Bailly, Joulain, Hervé, & Alaphilippe, 2011; Heyl, Wahl, & Mollenkopf, 2007), and have poor reliability and validity (Henselmans et al., 2011; Mueller & Kim, 2004). Despite this, there have been no attempts to develop more psychometrically sound measures. In addition, the role that assimilation and accommodation plays in young adults is under-researched as there are no appropriate scales for this population. We developed and validated new assimilation and accommodation scales suitable for young adults.

1.1 Assimilation

Assimilation is used when individuals focus on achieving a particular goal. In this mode, people attempt to modify their environment so it is congruent with their aspirations and sense of self (Brandtstädter & Rothermund, 2002). They engage in proactive, intentional behaviours, aimed at achieving their desired state. Information that is not relevant to the current goal, and which suggests that the goal might be difficult to attain, is inhibited. Conversely, information that will assist the person in attaining their goal becomes salient. People link achieving the goal with positive outcomes and a sense of meaning (e.g., “If I work hard, I will get the job I want.”), which increases their striving motivation, and their action resources (e.g., self-efficacy, perceptions of control) are directed towards modifying

their environment to facilitate goal attainment (Leipold & Greve, 2009). This mode is adaptive as it ensures that individuals maintain focus and motivation when actively pursuing a desired outcome (Brandtstädter & Rothermund, 2002; Frazier, Newman, & Jaccard, 2007).

1.2 Accommodation

Accommodation, which is also adaptive, refers to the process of modifying one's goals to match one's current situation or environmental constraints (Brandtstädter & Rothermund, 2002). It too is aimed at reducing the discrepancy between actual and desired (goal) states, but does so by downgrading or revising the desired state to be closer to the actual one. Accommodation is activated when efforts towards attaining a goal have proven futile and action resources are becoming depleted. This mode widens the person's scope of awareness and redirects their attention towards alternative goals (Brandtstädter & Rothermund, 2002). Information supporting the person's decision to give up or revise a goal comes to the fore, and cognitions that link the person's actual state with positive outcomes (e.g., "I'm proud of getting where I am in my career") are generated. In addition, unattainable goals are re-appraised and often downgraded or abandoned, while the attractiveness of alternative goals increases. This process often results in goal revision or goal re-engagement (Carver & Scheier, 1998).

Being somewhat trait-like, assimilation and accommodation are employed by people of all ages (Brandtstädter & Rothermund, 2002). However, age-based differences in the frequency of application have been suggested. Young people are generally thought to be more oriented towards assimilation as they have more resources (e.g., social support, physical strength, good health, time), and are, thus, more likely to perceive that they can attain their goals; older people are more likely to use accommodation strategies, as, for example, their time horizon is more limited (Brandtstädter, 1999).

1.3 Measuring Assimilation and Accommodation

Currently, assimilation and accommodation are assessed using the 15-item Tenacious Goal Pursuit (TGP) and the 15-item Flexible Goal Adjustment (FGA) scales, which were developed in German and translated into English by the scale developers (Brandtstädter & Renner, 1990). Two recent studies were critical of their psychometric properties. Support was not found for the 2-factor solution (the negatively and positively worded items loaded onto separate factors; Henselmans et al., 2011; Mueller & Kim, 2004), no association was found with age, as predicted by the dual-process framework (Mueller & Kim, 2011), and there is little support for content (i.e., when using expert raters) and construct validity (Henselmans et al., 2011). These authors concluded that the two scales do not differentiate between the two constructs, and recommended devising new scales.

Bailly, Hervé, Joulain, and Alaphilippe (2012) administered French translations of the TGP and FGA scales to 677 older adults (63 to 97 years), but again failed to find a 2-factor solution. After removing 5 low-loading items from each scale, they found two 10-item factors consistent with Brandtstädter and Renner's (1990) factors. However, the internal reliabilities of these shortened scales were modest ($\alpha = .78$ and $.76$) and FGA was not correlated with age as predicted. An additional limitation was the sample used, which limits these revised scales to use with elderly adults.

1.4 Present Study

Given these criticisms of existing scales, the aim of the current study was to develop and validate new scales to measure assimilation and accommodation. As the dual-process framework has implications for young people, who are expected to use more assimilation than accommodation strategies, we aimed to develop scales that were suitable for young adults, to allow the dual-process framework to be tested on this age group.

To provide evidence for construct validity of the new scales, we included measures of goal revision (engagement, disengagement, re-engagement) and well-being, which are drawn from the nomological net of these constructs. Assimilation is related to goal engagement, and accommodation is related to goal disengagement and re-engagement from goal-setting theory (Brandtstädter & Rothermund, 2002; Carver & Scheier, 1998). We used career goals as the context, as career development is an important developmental task in young adulthood (Haase, Heckhausen, & Köller, 2008). In addition, we included a measure of life satisfaction, which was used previously to validate the TGP and FGA scales (Brandtstädter & Renner, 1990).

2.0 Item Generation and Content Validity

2.1 Phase 1 - Content Validity of TGP and FGA Scales

Seven scale development experts rated the 30 TGP and FGA items. Eight TGP items (47%) were rated by > 80% of experts as assessing the incorrect construct (i.e., accommodation instead of assimilation), and two more items were considered to be poor measures of assimilation. Three FGA items (20%) were rated as assessing the incorrect construct (i.e., assimilation not accommodation), and three were considered to be poor measures of accommodation. Thus, the majority of TGP items and almost half of the FGA items showed poor content validity. This adds to the previous research (Henselmans et al., 2011; Mueller & Kim, 2004), which raised issues regarding construct validity. We then selected the five most highly rated TGP and nine most highly rated FGA items to inform the development of new items in Phase 2.

2.2 Phase 2 – New Item Generation

We followed procedures recommended by Hinkin, Tracey, and Enz (1997) to generate and validate 20 new assimilation and 21 new accommodation items, which we based on the original descriptions of the constructs (Brandtstädter & Renner, 1990; Brandtstädter &

Rothermund, 2002). As our target was to develop final scales with approximately 10 items in each, 41 initial questions were considered sufficient (Worthington & Whittaker, 2006).

Negative items were not included, as both Henselmans et al. (2011) and Mueller and Kim (2004) identified artifactual responding to negative items in the original scales and Barnette (2000) recommended that it is “best that all items be positively or directly worded and not mixed with negatively worded items” (p. 364).

Assimilation items were designed to assess the domains of modifying one’s internal and external environment and tenacious adherence to previously set goals. Accommodation items were designed to assess modifying or downgrading goals to match personal and external environmental constraints and flexible adjustment of previously set goals (Brandtstädter & Rothermund, 2002). We assessed emotional, cognitive, and behavioural aspects of these domains. Finally, based on recommendations by Henselmans et al. (2011), we used item stems of: “In general, when I have to do something that’s really important to me, and it’s really difficult, I usually...” (assimilation), and: “In general, when it turns out that I can’t do something that’s really important to me, I usually...” (accommodation). The stems were designed to cue participants to consider their typical behaviour when responding.

Six experts rated how well the new items measured the intended constructs. Based on this, 3 assimilation items were removed and 8 were modified slightly; 3 accommodation items were removed and 10 were modified. This process left 35 items (17 assimilation and 18 accommodation). Last, six young adults (66% female, mean age = 24 years) reviewed the 35 items, which led to minor alterations to 9 items.

3.0 Factor Analysis and Construct Validity

3.1 Participants and Procedure

The study was approved by the authors' university ethics committee. The sample was recruited by advertising the study on university web pages and posting a link to the online survey on Facebook. All participants could enter a prize draw for a \$100 voucher.

We recruited 471 young adults (75% female, mean age 22 years, range 18-29 years), 36% via Facebook, the remainder from the university. This sample was split randomly into Sample A, which was used for exploratory factor analysis, and a hold-out Sample B, which was used for confirmatory factor analysis and construct validity analyses.

Sample A comprised 235 participants (72% female, mean age 22 years). The majority identified as Australian (79%), with others identifying as European (8%), Asian (5%), British (3%), New Zealander (2%), North American (1%), South American (1%), and African (0.5%). Most participants (79%) had tertiary education and 19% had completed high school. Most (61%) were employed, 28% were full-time students, 8% were unemployed, and 2% were homemakers.

There were 236 in Sample B (77% female, mean age 22 years). The majority identified as Australian (78%), with others identifying as British (8%), European (5%), Asian (4%), New Zealander (3%), African (3%), North American (1%), and South American (0.5%). Most (73%) had tertiary education and 24% had completed high school; 68% were working, 26% were full-time students, 4% were unemployed, and 0.5% were homemakers. Chi-squared and *t*-tests showed no significant differences between the samples on gender, age, background, education, or employment status, indicating no sample bias as a result of the split.

3.2 Materials

Participants completed the new assimilation and accommodation items, scales to assess construct validity (goal engagement, disengagement, reengagement, and life satisfaction), and demographic items. All scales used a 6-point Likert-type response format (*Strongly disagree* to *Strongly agree*), where higher scores indicated stronger endorsement of that construct. For the goal revision scales, we primed participants to consider career-related goals, as these are salient for young adults (Seiffge-Krenke & Gelhaar, 2008).

3.2.1 Assimilation and accommodation. These were the 17 assimilation and 18 accommodation items devised in Phase 2.

3.2.2 Goal engagement. We use the 8-item Selective Primary Control subscale of the Optimization in Primary and Secondary Control Scale (Haase, Heckhausen, & Köller, 2008). An example item was: “I am investing all my energy in order to have a good occupational future.” Prior research reported sound reliability ($\alpha = .83$ to $.85$), and construct validity was supported by positive correlations with related behaviours such as apprenticeship seeking and discussions with parents about life after graduation. Alpha in the present study was $.90$.

3.2.3 Goal disengagement. We used the 4-item Goal Disengagement Scale (Wrosch, Scheier, Miller, Schulz, & Carver, 2003). An example item was: “If I had to stop pursuing my important career goals.../ ...it would be easy for me to reduce my effort toward them.” This scale has reported good reliability ($\alpha = .84$), and validity supported by a positive correlation with a question asking about the ease of abandoning specific goals (Wrosch et al., 2003). Our alpha was $.78$.

3.2.4 Goal re-engagement. We used the 6-item Goal Re-engagement Scale (Wrosch et al., 2003). An example item was: “If I had to stop pursuing my important career goals.../ ...I would think about other new career goals to pursue.” The scale has good reliability ($\alpha =$

.86) and validity evidenced by a positive correlation with the availability of alternative goals (Wrosch et al., 2003). Our alpha was .91.

3.2.5 Life satisfaction. We used the 5-item Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). An example item was: “In most ways, my life is close to my ideal”. Previous reliability has been good ($\alpha = .87$), and validity has been demonstrated by testing the associations with other life satisfaction measures (Diener et al., 1985). Our alpha was .88.

4.0 Results

4.1 Exploratory Factor Analyses – Sample A

All 35 items (17 assimilation and 18 accommodation) were subjected to an exploratory factor analysis (EFA; principal-axis extraction with direct oblimin rotation) using Sample A data. We considered several indicators to determine the number of factors to retain (Worthington & Whittaker, 2006), including a parallel analysis (Horn, 1965), eigenvalues > 1.0 , the scree plot, the number of items per factor (ideally > 4 per factor; Russell, 2002), interpretability of the factors (Hinkin et al., 1997), and theory (2 factors expected).

The KMO measure of sampling adequacy (.90) and Bartlett’s test of sphericity, $\chi^2(595) = 5267.63, p < .001$, indicated that the 35 items were suitable for factor analysis. The parallel analysis indicated five factors in the data; whereas, the EFA indicated six eigenvalues > 1.0 . In both analyses, the first two factors had eigenvalues substantially larger than the others (8.54, 7.42, 2.31, 1.08, 0.74 for the parallel analysis; 10.01, 6.90, 2.16, 1.43, 1.24, 1.07 for the EFA). Additionally, in the EFA, Factors 3 to 6 contained insufficient items to be considered stable (2, 2, 3, and 4, respectively; Russell, 2002). Factor 1 contained 11 assimilation items and Factor 2 had 13 accommodation items. As this was consistent with theoretical expectations, reflected the expert rating in Phase 2, and mirrored the goal of the

study to develop two measures, one each for assimilation and accommodation, we based the item reduction on a 2-factor solution.

As the goal of the study was to devise two scales with approximately 10 items in each, we conducted a series of EFAs and progressively deleted unwanted items. In the first analyses, we removed items that did not load ($> .32$) on their expected factor or were cross-loading ($> .32$; Worthington & Whittaker, 2006). When we had identified two factors with simple structure (i.e., all items loading strongly on one factor with negligible loadings on the other; Worthington & Whittaker, 2006), we then selected items with high factor loadings to ensure purer measures of the two constructs. We were able to do this as we began with 35 items and were seeking approximately 20 for the final scales. In this latter process, we did not simply select items with the highest factor loadings; rather, we chose high loading items that ensured broad coverage of the two constructs indicated in Phase 2.

In the first step, we removed one accommodation and one assimilation item that did not load significantly on either factor, one accommodation item that loaded on the assimilation factor, one negatively loading assimilation item, and two cross-loading accommodation items. In the second step, we removed two assimilation and one accommodation item that had loadings $< .60$. Finally, after considering construct coverage, we deleted two accommodation (factor loadings = $.60$ and $.66$) and four assimilation items (factor loadings = $.63$, $.67$, $.67$, and $.70$) to yield two clear 10-item factors.

We labelled these factors as “assimilation” and “accommodation” (see Table 1). They were largely independent ($r = -.05$), accounted for 58.84% of the variance, and had factor loadings ranging from $.59$ to $.74$ (assimilation) and $.60$ to $.89$ (accommodation). Consistent with this, a final parallel analysis indicated that the items could be best represented by two factors. The final items covered all domains identified by Brandtstädter and Rothermund (2002); that is, modifying one’s internal and external environments and tenacious adherence

to previously set goals for assimilation, and modifying or downgrading goals to match constraints and flexible adjustment of previously held goals for accommodation. We also maintained coverage of emotional, cognitive, and behavioural manifestations for each domain. Thus, the two new scales assessed the same domains as the original scales (Brandtstädter & Renner, 1990), indicating support for content validity.

4.2 Confirmatory Factor Analysis - Sample B

We employed a 2-step procedure to confirm the factor structure of these two 10-item scales on Sample B (the hold-out sample). Byrne (2010) indicated that maximum likelihood estimation (ML) is appropriate for confirmatory factor analysis (CFA) when the number of categories are ≥ 4 (we used a 6-point response format) and the variables are normally distributed (ours met this criterion), but that ML estimation can be validated by confirming the model using Bayesian estimation (BE), which is appropriate for non-continuous data. BE permits a comparison of the estimates from both analyses. Thus, we assessed the factor structure of the final 20 items using CFA with ML and BE estimations, which are both available in AMOS 21. CFA fit using ML estimation was good for a 2-factor structure, $\chi^2(160) = 302.92, p < .001, \chi^2/df = 1.89, CFI = .95, RMSEA = .06$, which was significantly better, $\chi^2_{Diff}(1) = 966.74, p < .001$, than for a 1-factor solution, $\chi^2(161) = 1269.66, p < .001, \chi^2/df = 7.89, CFI = .63, RMSEA = .17$. Standardised regression weights ranged between .58 and .88 for accommodation and .59 and .78 for assimilation. The unstandardized estimates using BE paralleled those for the ML analysis, indicating the two sets of results were consistent. These estimates have been included in Table 1 and the ML CFA model is reported in Figure 1. Cronbach's alphas were good at .91 (assimilation) and .93 (accommodation).

4.3 Construct Validity – Sample B

Construct validity was assessed by examining the relationships between scores on the assimilation and accommodation scales and measures of goal revision and life satisfaction,

using Sample B ($N = 236$; see Table 2). In support of construct validity, assimilation was associated positively with goal engagement, goal re-engagement, and satisfaction with life, and was associated negatively with goal disengagement. For accommodation, construct validity was demonstrated by positive associations with goal disengagement and goal re-engagement. However, contrary to expectations accommodation was not correlated with life satisfaction. A paired sample t -test ($t = -12.05, p < .001$) indicated that the mean score for assimilation was significantly higher ($46.30; SD = 6.69$) than the score for accommodation ($37.62; SD = 8.47$), indicating that the young adult sample was using assimilation more than accommodation, as anticipated by the dual-process model. No gender differences were found for accommodation, $t(234) = 1.95, p = .57$, or assimilation, $t(234) = 1.95, p = .08$, which is desirable as gender differences are not proposed by theory. Overall, these results provide initial support for the construct validity of the two scales.

5.0 Discussion

This paper describes the development and initial validation of two 10-item scales suitable for measuring assimilative and accommodative resources in young adults. These scales were needed as existing scales have been criticised for their poor psychometric properties (Henselmans et al., 2011; Mueller & Kim, 2004), and were devised for older, rather than younger, adults (Bailly et al., 2012; Brandtstädter & Renner, 1990).

Expert reviews initially confirmed that many items in the existing scales (TGP and FGA) lacked content validity, confirming the need for new scales. This review also identified high quality items from the existing scales, which were then used to inform the generation of new items. The new items were subject to review by both experts and young adults, providing evidence for content validity. EFA clarified the factor structure and reduced the number of items to ten per scale, and a CFA on a hold-out sample confirmed the proposed 2-factor structure. We provided initial evidence for construct validity by finding expected

correlations with measures of goal engagement, disengagement, re-engagement, and life satisfaction, demonstrating factorial independence, and finding higher scores for assimilation than accommodation, as predicted for young adults by the dual process framework (Brandtstädter, 1999). The two new scales also demonstrated high internal consistency.

We developed the scales using a convenience sample of young adults, which was westernised, predominantly Australian, and over-represented by women and tertiary educated young adults. Further validation of the scales on other samples of young adults is needed. For example, assimilation and accommodation might operate differently in less well-educated populations (as individuals have fewer resources available to them) or in collectivist cultures (where young individuals are more likely to accommodate to the goals of their referent group; Elliot, Chirkov, Kim, & Sheldon, 2001). Future studies also need to provide evidence of predictive validity.

5.1 Conclusions

Young adults work on a variety of developmental tasks (e.g., completing their education, choosing a career, developing relationships), which require adaptive goal management behaviours (Seiffge-Krenke & Gelhaar, 2008). Understanding these adaptive behaviours and how they relate to well-being and actions is a pressing theoretical challenge (Brandtstädter, 2009). Having sound scales to measure assimilation and accommodation for this age group will allow researchers to investigate the role that self-regulation plays in their goal management.

At just 10-items each, the new scales are practical and convenient for use by researchers. They demonstrate a psychometric advantage over the existing TGP and FGA scales, and have the advantage of being developed for use with young adults. They can be used together, and, as individuals use both assimilative and accommodative resources (Brandtstädter & Rothermund, 2002), having both measures will provide the most useful

information about their typical orientation. It is expected that these scales will provide new impetus to apply the dual-process framework to understand goal management in young adulthood.

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Table 1
Results of Initial and Final EFA (N = 235) and CFA (N = 236)

Items	Initial Loadings		Final Loadings		B/SE ML ^a	B/SE BE ^b
Accommodation						
Accom1 ...stop wasting time and energy on it*	-.20	.67	-.15	.65	.94/.11	1.03/.11
Accom2 ...decide that other things are more important to me	-.26	.64				
Accom3 ...move on to something else*	-.25	.80	-.18	.80	1.11/.12	1.20/.01
Accom4 ...accept that I cannot achieve it*	-.26	.70	-.19	.70	1.09/.13	1.19/.01
Accom5 ...think about other things that I might try to achieve instead*	.01	.76	.09	.81	1.04/.11	1.13/.01
Accom6 ...feel contented with my efforts; after all, great obstacles stood in my way*	.07	.64	.08	.60	.93/.09	.98/.01
Accom7 ...work on something else instead*	-.16	.84	-.06	.89	1.26/.12	1.36/.01
Accom8 ...turn my attention to something that I am more likely to achieve*	-.07	.81	.01	.85	1.23/.12	1.33/.01
Accom9 ...don't feel too concerned about it as I will find something else to work on*	.05	.80	.10	.78	-	-
Accom10 ...work on alternative projects*	-.01	.80	.08	.85	1.06/.11	1.15/.01
Accom11 ...think about other things that I could focus on instead*	-.06	.75	.01	.78	1.18/.11	1.27/.01
Accom12 ...relax because I know that other opportunities will arise	.17	.63				
Accom13 ...give up on it	-.36	.57				
Accom14 ...concentrate on what I have gained from the experience	.39	.44				
Accom15 ...adjust to my new circumstances rather than worrying about it	.25	.58				
Accom16 ...think positively about the effort I put in	.48	-.01				
Accom17 ...find it difficult to let go	-.09	-.14				
Accom18 ...can't stop thinking about the fact that I failed	-.31	-.07				
Assimilation						
Assim1 ...feel more determined to use my skills and experience*	.66	-.15	.68	-.09	-	-
Assim2 ...keep working towards it*	.67	-.18	.69	-.12	1.00/.08	1.04/.01
Assim3 ...plan to undertake training or gather additional information to help me	.60	-.05				
Assim4 ...feel confident that using the resources and supports available to me will help me overcome the difficulties	.68	.06				
Assim5 ...get motivated by thinking about how important it is to me*	.60	-.09	.59	-.05	.92/.11	.96/.01
Assim6 ...feel positive that I can persist*	.72	.03	.72	.05	1.18/.11	1.25/.01
Assim7 ...try different approaches or strategies*	.69	.04	.74	.11	1.02/.11	1.07/.01
Assim8 ...think about what I have done in similar situations in the past and use this to help me get through it	.58	.02				
Assim9 ...feel optimistic about my ability to make changes in order to overcome any obstacles	.67	.03				
Assim10 ...invest more of my time and energy towards it*	.67	-.04	.70	.01	1.08/.11	1.14/.01
Assim11 ...think about strategies that I can use to prevent potential problems*	.60	.06	.62	.11	1.07/.11	1.13/.01
Assim12 ...maintain a positive attitude by trying out different approaches until I find something that works*	.74	-.06	.74	-.02	1.22/.12	1.29/.01
Assim13 ...try to deal with the barriers that are getting in my way*	.68	-.04	.70	.01	1.08/.10	1.15/.01
Assim14 ...feel more motivated	.67	-.07				
Assim15 ...double my efforts*	.67	-.12	.63	-.09	1.10/.13	1.67/.01
Assim16 ...don't allow myself to get distracted by easier tasks	.52	.27				
Assim17 ...give up and work on something else	-.51	.24				
Eigenvalues	10.00	6.89	7.33	4.43		
Percentage of Variance	28.59	19.70	36.67	22.17		

^aUnstandardised weights and standard errors from maximum likelihood estimation; ^bUnstandardised weights and standard errors from Bayesian estimation*Items retained in final scales

Table 2

Summary Data and Bivariate Correlations (N = 236)

Scale	<i>M</i>	<i>SD</i>	Range	2	3	4	5	6
1. Assimilation	46.78	6.05	26-60	-.05	.59***	-.35***	.29***	.21***
2. Accommodation	37.06	8.90	10-57	-	.01	.12*	.19**	.10
3. Goal engagement	35.40	6.38	11-48		-	-.38***	.31***	.22***
4. Goal disengagement	16.12	3.76	7-24			-	-.02	-.06
5. Goal re-engagement	27.41	4.57	6-36				-	.17**
6. Satisfaction with life	20.75	5.34	5-30					-

* $p < .05$; ** $p < .01$; *** $p < .001$

Figure 1. Path diagram for final 2-factor solution with standardised regression weights.