Investigating Locus of Control, Self Efficacy and Wellbeing - The relationships between all items across 3 instruments for a single item scale.

Quality Improvement Fund Bid – Final report

Key Findings

Among two large samples of adults in Northern Ireland:

- Exploratory quantitative analyses identified two distinct, yet related, subscales of locus of control (LOC): internal and external;
- The scale for general sense of self-efficacy worked well and had good internal consistency;
- Consistent with previous research, both internal LOC and self-efficacy were positively related to well-being after controlling for age, gender and marital status;
- Contrary to expectations, there was no negative relation between external LOC after controlling for the other variables of interest;
- Mediation analyses suggested that having higher levels of internal LOC may lead to more self-efficacy, which in turn, will predict higher levels of well-being.

Introduction

Over the past two decades, the government has invested millions in personal and community development in Belfast and across Northern Ireland. Despite incredible progress, there is an increasing desire to understand how and why intervention programmes work. Moreover, targeting key constructs across a range of programmes may also shed light on overall efficacy and potential sustainability of intervention efforts. The current internal report aims to better understand two key constructs – locus of control and self-efficacy – and their relation to individual well-being among adults in Northern Ireland.

After exploring these variables at a theoretical level, including their relations to well-being, this report will analyse data from the Belfast City Council (BCC) Resident Survey and the Northern Ireland Continuous Household Survey (CHS). This brief report concludes with some suggestions for future measurement refinement and data analyses.

Background

Locus of control

Locus of control (LOC) is a personality construct that explains the degree that individuals feel they have control over the events in their lives. Rotter (1954) originally proposed that there are two ends on a continuum of locus of control: internal and external. Those with internal LOC believe that they can influence consequences in their lives, or their actions affect their life outcomes, whereas those with external LOC believe that outcomes are the result of fate or destiny and outside of personal control.

Internal or external LOC comes into play when confronting challenges or difficulties in life, and there are degrees to which individuals may approach life. That is, the individuals with higher internal LOC will take more responsibility for their lives, strive for achievement, have a strong sense of self-efficacy (see below), are confident in tacking problems, and finally, are more likely to report higher levels of happiness. On the other hand, individuals with higher external LOC are more likely to blame others or fate/destiny for lack of success, have lower self-efficacy, and may report lower levels of well-being (in some exceptions, individuals with external LOC report being more ‘laid back’ which leads to more relaxed and happy lives).

There are some basic trends that have been found in terms of the balance of internal and external LOC. In general, males are more likely to report internal LOC compared to females, internal LOC increases with age, and individuals higher up in organisational structures are more likely to report internal LOC. That said, internal LOC is not always preferable. The personality construct needs to be accompanied by self-efficacy (see below)
and opportunity; if individuals with internal LOC have a realistic sense of their skills and capacities, they will be able to act and experience success in the face of challenges.

**Self-efficacy**

Bandura defines self-efficacy as “people’s beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives” (1994, p. 71). Perceived self-efficacy shapes cognition (how people think), emotions (how people feel), and behaviours, including motivation. For example, people with high self-efficacy are often confident in their capabilities and thus set challenging goals for themselves. Toward this end, individuals with high self-efficacy are also motivated to sustain their efforts to achieve their goals, even in the face of adversity. On the other hand, people who have low self-efficacy may doubt their capabilities, be less ambitious, be less likely to follow through, and be more likely to perceive challenges as personal threats. Thus, people with higher self-efficacy are more likely to experience personal well-being, while those with lower self-efficacy are more likely to be plagued by self-doubt and depression. In short, self-efficacy is related to resilience and grit, or the ability for individuals to cope with and overcome setbacks.

As part of the cognitive process, or how people think about themselves and the world around them, self-efficacy is related to goal setting and performance. That is, if government programmes are designed around personal or social change, and in particular changes that may last beyond the length of the intervention, targeting self-efficacy may be particularly important. For example, self-efficacy may be learned or fostered through mastery of experiences (i.e., experience success even in small goals), social persuasion (e.g., positive feedback/praise), and even social modelling (e.g., seeing people similar to oneself succeed). If these steps help to bolster self-efficacy, individuals may be more likely to visualise success scenarios, which provides them with positive steps to take to increase performance and latter outcomes.

In addition to these cognitive aspects, self-efficacy also has roots in affective, or emotional processes. That is, individuals who are low in self-efficacy may feel more anxious about potentially difficult situations and avoid setting goals around topics that are important to them. This emotional response of fear to potential adversity can be paralysing and may undermine intervention efforts targeted and behavioural change. Interventions targeting self-efficacy may also need to address ways to decrease the negative affective or emotional response to stressors, which in turn may help to bolster overall well-being.

Previous research on self-efficacy across the lifespan has supported these theoretical claims. For example, focusing on emerging adulthood as youth transition from educational settings into the workforce, studies have found the importance of self-efficacy. That is, self-efficacy will shape how people prepare for their careers or vocations, in terms of their self-management, interpersonal skills, and problem-solving skills when presented with workplace challenges (e.g., under or unemployment, skills development, redefining career pathways). Another domain in which self-efficacy has been highlighted as an important construct is in parenting and cohabiting relationships. The balance of personal, family and community stressors and resources is a key challenge during this period; individuals with higher self-efficacy may be better able to cope with such difficulties and constructively adapt to related adversity. Finally, with age and increasing health concerns, self-efficacy has been identified as an essential variable to understanding effective interventions. Thus, self-efficacy is a factor that may underlie successful interventions, from weight loss to coping with cancer; individuals with higher self-efficacy are more likely to stick to treatment plans and stay motivated to achieve health-related goals.

In conclusion, if perceived self-efficacy is “peoples’ belief in their capacity to exercise control over their own functioning and the events that affect their lives” (Bandura, 1994; p. 81), this may be closely related to the first construct of interest: locus of control.

**Well-being**

“Well-being is a dynamic concept that includes subjective, social, and psychological dimensions as well as health-related behaviours” (Seifert, 2005). Well-being is an important construct, both as an outcome and as a factor that helps individuals realise their true potential. More complex forms of measurement of well-being...
include the dimensions that include autonomy and management of complex environments; this suggests that it would be related to internal LOC. In addition, well-being has been understood as having a purpose in life and pursuing goals, which also coheres with internal LOC. Psychological well-being can be both momentary and long-term, but it has both cognitive and affective aspects. The cognitive part is “information based appraisal of one’s life that is when a person gives conscious evaluative judgments about one’s satisfaction with life as a whole” (Diener, 1997). The affective part is “guided by emotions and feelings such as frequency with which people experience pleasant/unpleasant moods in reaction to their lives” (Diener, 1997). But, overall, well-being is the basic degree to which individuals consider their life to be good or bad.

Longitudinal studies have found a long-term influence of perceived control on later well-being, a relation that is affected by employment status for both men and women (Infurna et al., 2016). That is, as people spent more time unemployed, it was related to decreased perceived control, which in turn was linked with lower life satisfaction. Internal LOC was also related to greater life satisfaction among young adults through their striving for goals (Hortop, E., Wrosch, C., & Gagné, 2013). On the other hand, studies have found external LOC related to more mental health problems, such as anxiety and decreased hopefulness (Brown et al., 2015). The link between external LOC and depression has also been found for those who have experienced economic adversity (Culpin et al., 2015).

Previous research has also found strong links between self-efficacy and well-being (Priesack & Alcock, 2015; Shoshani & Steinmetz, 2014). For example, a link between leadership qualities and global life satisfaction has been found to be mediated by self-efficacy (Weber et al., 2013). A number of interventions designed to increase self-efficacy have been found to have an impact on lowering depression (Feldstain et al., 2016) and increasing well-being (Heuvel et al., 2015). Other practical interventions have found the by increasing self-efficacy, participants were less likely to regain lost weight (Burke et al., 2015), those caring for cancer patients reported higher well-being (Hendrix et al., 2016), and working moms reported lower perceived stress (Mailey & McAuley, 2014).

Finally, there is limited research that includes both LOC and self-efficacy; yet, one study that linked the two constructs found that internal LOC as a predictor of self-efficacy among Chinese students (Zhou et al., 2016). This study, along with the theories above that suggests that internal LOC may lead to higher levels of well-being when individuals have a realistic self-efficacy. For example, when individuals believe they can influence the outcomes in their lives, it leads to them having a greater sense of self-efficacy, which in turn leads to success in goal attainment and overall higher levels of well-being and life satisfaction. The following section presents empirical tests of these relation on new datasets in Northern Ireland.

Methods and Measures

The primary analyses were conducted on two datasets, the Belfast City Council (BCC) Resident Survey (N=1500; 46% Male, 54% Female) and the Northern Ireland Continuous Household Survey (CHS) 2014-15 (N=3320; 49% Male, 51% Female). The two datasets included similar items for the primary scales of interest and control variables.

Locus of control (LOC). The two datasets had different number of items, so only the consistent items were used to assess locus of control. To understand the pattern of responses across participants, preliminary analyses, described below, were conducted. This approach is data-driven and allows for new insight into scale formation based on how participants interpret and respond to the specific items. This approach indicated two distinct forms – internal and external, each assessed with two items. Participants responded to four questions (five in the CHS) about how they felt on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree. The two internal LOC items were “I am in control of my life” and “If I take the right steps, I can avoid problems.” The two external LOC items were “Most things that affect my life happen by accident” and “If it’s meant to be, I will be successful.” All of the items were coded, or recoded, so that higher scores indicated more agreement with either internal or external LOC. Even though these subscales were only two items each, this approach lead to acceptable to good internal consistencies in the BCC (internal LOC a = .84, external LOC a = .72), however, the CHS has less acceptable alphas (internal LOC a = .60, external LOC a = .46).
General sense of self-efficacy (GSES). This construct was assessed with five items that the degree to which individuals agreed with the statements: “I can always manage to solve difficult problems if I try hard enough,” “I am confident that I could deal efficiently with unexpected events,” “I can remain calm when facing difficulties because I can rely on my coping abilities,” “When I am confronted with a problem, I can usually find several solutions,” and “No matter what comes my way, I’m usually able to hand it.” Participants responded on a 5-point likert scale from 1 = strongly disagree to 5 = strongly agree; thus, higher scores indicated higher levels of self-efficacy. Preliminary analyses, described below, indicated a single factor solution for both datasets. The scale had good internal consistency across both datasets (BCC a = .92; CHS a = .85).

Well-being (WB). A single item was used to assess overall well-being. Participants responded on an 11-point likert scale from 0 = not at all satisfied to 10 = completely satisfied to the following question: “How satisfied with life nowadays?” Higher scores indicated greater overall life satisfaction which represents higher general well-being.

Control variables included gender (1 = male, 2 = female) and marital status (1 = single/separated/divorced/widowed, 2 = married/civil partnership). Age was also included as a control variable in the CHS dataset, but was not available for the BCC.

Results

Preliminary Analyses

With large, representative samples and new scales it is advised to conduct exploratory analyses to better understand the structure of relations among the items for the scales for LOC and GSES. That is, rather than impose a scoring rubric, an approach that is an inductive and data-driven was used that allowed patterns across the participants to emerge. This approach, exploratory factor analyses (EFA), reveals how participants understand and respond to the specific items, and may facilitate scale revision and reduction. In this approach, the underlying relations among all of the items are estimated, and they are grouped based on similarities in the participants’ responses. These groupings are called ‘factors’ and represent convergence onto underlying constructs. The approach used to estimate the underlying factors utilized maximum likelihood estimation and promax rotation, which allows for factors to be correlated. That is, the EFA will reveal if the underlying relations among the manifest (or measured) items converge onto a single latent (or underlying) factor, or if multiple factors are needed to explain the pattern of responses across the participants.

First, for locus of control, an EFA was conducted on all of the available items, that is, those that assessed internal and external LOC. The EFA revealed a two-factor solution; that is, the internal and external items loaded onto different underlying constructs. Any cross-loadings between the two factors were negative. Thus, it was decided to leave the two aspects of LOC as separate, though related, scales. That is, rather than collapse into a single scale (which had unacceptably internal consistency), the EFA suggested that we should retain two separate scales, one for internal LOC and one external LOC, each with two items.

Second, for self-efficacy, a separate EFA was conducted with all five items in each of the datasets. The factor solution for each dataset was straightforward and revealed a single factor. That is, all of the items loaded highly and consistently onto the underlying latent factor. For example, in the CHS dataset the loadings were .66-.81 and for the BCC were .81-.86 (on a scale from 0 to 1, with higher being stronger). This suggests that the GSES functions as a coherent scale with all five items, which is reflected in the good internal consistencies reported above.
Table 1 reports the means, standard deviations, ranges, and bivariate correlations for all of the main variables of interest, including internal LOC, external LOC, self-efficacy, and well-being, with the relevant controls. The CHS dataset is above the diagonal and the BCC dataset is below the diagonal.

First, multiple regression was conducted in each dataset to determine the relative weight of predictors for the primary outcome of interest: well-being. In the CHS dataset, well-being was regressed on internal LOC (\( ß = .30, \ p < .001 \)), external LOC (\( ß = -.02, \ ns \)), GSES (\( ß = .17, \ p < .001 \)), and the controls of sex (female \( ß = .08, \ p < .001 \)), marital status (\( ß = .14, \ p < .001 \)) and age (\( ß = -.06, \ p < .01 \)). All of the predictors were significant, except for external LOC. The standardized regression coefficients (\( ß \)) indicate the relative strength of each factor on a scale from 0 to 1, with higher being a stronger predictor of well-being. It should be noted, however, that because of the large sample size, many of the controls are statistically significant, but do not represent large effects. The total model accounted for 19% of the variance in well-being.

The same pattern of findings was found for a multiple regression predicting well-being in the BCC dataset. Again, all of the predictors were significant, except for external LOC: internal LOC (\( ß = .22, \ p < .001 \)), external LOC (\( ß = -.01, \ ns \)), GSES (\( ß = .11, \ p < .01 \)), and the controls of sex (female \( ß = .06, \ p < .05 \)) and marital status (\( ß = .08, \ p < .01 \)). All of the predictors were significant, except for external LOC. However, this model only accounted for 10% of the variance in well-being for individuals in the BCC dataset. Together, this set of findings suggests that both internal locus of control and general sense of self-efficacy are positively and significantly related to higher well-being.

Second, based on the background reading, a mediation test was conducted. The goal of mediation is to identify causal mechanisms, or how and why certain processes unfold. There are limitations to testing these processes without experimental design and with cross-sectional data, yet these initial steps may indicate promising future directions. In this paper, mediation was tested using a non-parametric, bias-corrected bootstrap approach with 1,000 resamples to construct a 95% confidence interval around the indirect effects for a path model (Fritz & MacKinnon, 2007; MacKinnon, Lockwood, & Williams, 2004). This approach offers a number of advantages compared to traditional mediation in which separate analyses are used to regress the dependent variable on the mediator and the independent variable, and then to regress the mediator on the independent variable (Baron & Kenny, 1986; Sobel, 1982). The current approach, however, estimates all of the direct and indirect effects in a single model, including controlling for the relations among multiple independent variables. The bootstrap approach assesses the accuracy of statistic of interest, in this case the indirect effect, by creating a confidence interval; if 0 is not contained within the interval, the result is statistically significant. That is, if the confidence interval for the indirect effect (i.e., the relation of independent variables on the dependent outcome via the mediator) does not contain 0, there is significant mediation. If the remaining direct effect (i.e., the path between the independent variables and the dependent outcome) is not significant, it is full mediation; if the direct effect remains significant, then it is partial mediation.
For both datasets the same pattern holds: the influence of internal LOC on well-being is partially mediated by general self-efficacy. That is, using the bootstrapped mediation described above, the indirect effect for both the CHS ($b=.12(.01)$, CI(95): .08, .15) and the BCC ($b=.04(.02)$, CI(95): .004, .08) datasets were significant. Figure 1 depicts the conceptual mediation relation, reporting unstandardized regression coefficients and standard errors. The significant direct effects of internal LOC on well-being, after taking into account the relation through GSES, indicates that there is only partial mediation. Overall, these findings can be interpreted as: individuals with internal locus of control are more likely to see themselves as effective actors, which in turn has positive implications for their well-being.

**Discussion and Future Investigation**

Previous research suggests that both internal LOC and self-efficacy are important constructs that should predict higher well-being and life satisfaction. The preliminary and primary analyses across two large datasets support this direction. Moreover, a mediation analysis suggested that there is a set of relations in which internal LOC leads to higher self-efficacy, which in turn, predicts well-being. These findings may suggest that although both variables may be important, the order of effects may be helpful to understand how internal LOC and self-efficacy relate to well-being.

During preliminary data analysis it was decided to treat internal and external LOC as two separate scales, rather than ends of a single spectrum. This choice was made based on the exploratory factor analyses that revealed that even though theoretically internal and external are two poles on a single spectrum, participants do not respond to those as such with the revised scales. This could in part be due to the formulation of the questions (i.e., that in order to combine them, the external items had to be reverse coded). While additional analyses were also conducted without reverse coding, this did not reveal coherent scales either. Thus, future research may consider using the two items for internal LOC separately from the two items for external LOC. Future research could also investigate whether individual items for each of these subscales also have similar predictive properties and could be used in an abbreviate fashion.

The general sense of self-efficacy scale, on the other hand, functioned as a coherent and strong scale with the five items. The exploratory factor analysis and internal consistency suggested that each item contributed to the overall scale; however, future analyses can also try to reduce the number of items used to assess this construct. For example, it may be possible to select three or fewer items that could capture self-efficacy while offering a shorter scale.

Given the previous literature on increase self-efficacy and its importance across a range of social and health domains, future analyses could also examine how this construct changes, and how those changes, in turn,
relate to well-being. Also, additional time points (e.g., pre-post) are also better positioned to test mediation and control for earlier levels of each construct to better assess how processes may unfold.

The datasets used, the Belfast City Council Resident Survey and the Northern Ireland Continuous Household Survey, both include large samples, representative of the largest city and the region, respectively. The sample sizes in the BCC and CHS are sufficient for establishing the construct validity and internal consistency of these scales, as well as the underlying relations among the constructs. However, what works to enhance well-being among a normative population may not hold among marginalized or at-risk samples. Additional datasets, even if smaller in sample size, that target other sectors of the society in Northern Ireland would also be a valuable contribution and extension of this review and may lead to even greater insight into how to help all individuals in Northern Ireland to improve their lives.

Finally, there are a number of more advanced analyses that may shed additional light on how internal LOC and self-efficacy relate to well-being. For example, future research could consider multiple-group comparisons; this type of test is designed to assess if the relations are the same across different groups of people (e.g., male/female, employed/unemployed, young/old, at-risk/normative). For example, previous research suggests that employment status has an important role to play in the link between locus of control and well-being. Another approach includes nested designs which would allow for understanding pattern of relations based on geography; for example, we could conduct additional analyses that take into account where people live/postcode. That would enable us to see if geographical variation (e.g., rural/urban) affects the relations across internal LOC, self-efficacy and well-being. Another possible option for additional analyses would include latent class analysis; this is another exploratory quantitative method that identifies class, or group, membership among participants. This type of analysis could help to assess if there are different types of characteristics that lead to higher well-being; for example, it could be higher levels of self-efficacy and internal LOC to yield better mental health or life satisfaction.

The current internal report provides initial insight into two important constructs – locus of control and self-efficacy – and their relation to individual well-being among adults in Northern Ireland. A brief theoretical background was followed with preliminary exploratory quantitative analyses and primary statistical tests that established a basic relation across these variables. In these data of adults in Northern Ireland, both internal LOC and self-efficacy are positively related to well-being. However, a mediation analysis also revealed that there may be an underlying relation across these constructs, such that having higher levels of internal LOC may lead to more self-efficacy, which in turn, predicts higher life satisfaction. Future data analyses could future refine the measures as well as look at greater nuance across different subgroups or geographic regions to better understand how locus of control, self-efficacy and well-being are related among adults in Northern Ireland.
References


