

The effects of unemployment on locus of control: A meta-analysis

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Existing research is ambiguous about the effects of unemployment on locus of control and the potential moderators to change. This meta-analysis aims to evaluate current research to conclude whether unemployment leads to changes in locus of control and whether assessment timing and status prior to unemployment moderate this change. Online databases were searched for studies published between 1954 (which saw Rotter first develop the concept of locus of control) and 2018. Twelve longitudinal studies were sourced that used a validated measure to assess locus of control in either students or among part- or full-time employed and then again among the same group following job loss or the termination of studies. Random effects modelling pointed towards a small but statistically significant change in locus of control towards greater externality ($d = 0.18$, 95% $CI = 0.09-0.26$, $p = 0.000$, $k = 11$). Moderator analyses suggested that this change was more significant in students entering unemployment ($d = 0.23$, 95% $CI = 0.09-0.38$, $p = 0.002$, $k = 6$) than among former employees and that greater change could be observed when a second assessment was made closer to the time of first assessment ($d = 0.23$, 95% $CI = 0.15-0.31$, $p = 0.000$, $k = 2$). This meta-analysis concludes that there is a statistically significant change in locus of control following unemployment but that this change might not extend to clinical significance.

Keywords: assessment; control; locus of control; meta-analysis, unemployment

Unemployment is related to a range of both physical and mental health complaints, from cardiovascular disease (Jin et al., 1995) through to anxiety, depression, somatisation (Dooley et al., 1996; Paul & Moser, 2009) and a decrease in life satisfaction that can persist even after regaining employment (Lucas, 2007). Despite this wealth of research on the physical and mental health consequences of unemployment far fewer studies examine the link between job loss and a resultant reduction in perceived control, as measured through locus of control beliefs.

Locus of control refers to the degree to which individuals feel control over their lives, as opposed to control resting in the hands of fate, chance, or other environmental, societal or economic forces (Rotter, 1966). It is usually conceived of as being internal, in which individuals feel broadly in control of their lives, or external, in which control is felt to lie elsewhere. Despite locus of control often being treated as stable and enduring across the lifespan (e.g., Borghans et al., 2008) there is increasing evidence that locus of control beliefs can and do change (Anderson, 1976; Coughlin et al., 2000; Gottschalk, 2005), making them a good target for interventions.

Changes in Locus of Control can be understood through the framework of a dynamic developmental model (DDM) (Woods et al., 2013) of personality, in which there is a reciprocal relationship between personality and life experiences. Through this lens, locus of control not only predicts outcomes of unemployment but can be affected in turn. Despite studies linking internal locus of control beliefs with reemployment (McGee, 2014; Water & Moore, 2002), fewer studies have looked at how being unemployed affects locus of control beliefs. Those studies that have examined the link have found mixed results, with some finding significant effect sizes (Moore et al., 2007; Parnes & King, 1977; Patton and Noller, 1984) and others reporting no significant effect (Lennings, 1993; Preuss & Hennecke, 2018; Winefield & Tiggemann, 1985). Of those studies that did find a change in orientation, typically unemployment is related to an increase in external locus of control beliefs (Moore et al. 2007; Layton, 1987), though curiously Legerski et al. (2006) used Levenson's (1981) locus of control scale to examine change in steelworkers' control beliefs following lay-off and found that, while beliefs about chance and powerful others remained stable, there was an increase in beliefs about internal control.

These findings could be due to the number of moderators affecting how individuals adjust to job loss. Bandura (1977) conceptualises employment as an important source of perceived control, but the degree to which job loss results in a loss of such feelings can be moderated by former satisfaction with and commitment to employment and reasons for unemployment (Goldsmith et al., 1996; Graetz, 1990). Further, studies have assessed locus of control beliefs and unemployment among different age groups, across different socioeconomic backgrounds and at different points following job loss (e.g., Feather & O'Brien, 1986; Frost and Clayson, 1991; Lennings, 1993; Winefield & Tiggemann, 1990). If locus of control beliefs can change as a result of job loss it could pose further challenges during an already difficult time and reduce the likelihood of successful reemployment. External locus of control is associated with reduced job search efforts (Caliendo et al., 2015; McGee, 2014) and correlates positively with depression, anxiety and somatisation (Holder & Levi, 1988; Selander et al., 2005; Wu et al., 2004).

Despite there being a well-developed literature on the effects of unemployment on health and well-being (Dooley et al. 1996; McKee-Ryan et al. 2005; Paul & Moser, 2009) far less exists on the effects of unemployment on locus of control. Several of those studies that do look at the broader consequences of job loss are narrative reviews (Hanisch, 1999; Wanberg et al., 2005) while a systematic quantitative review of research in this area is still to be undertaken. Those studies that have been conducted into the effects of unemployment on locus of control often lack external validity and are affected by small sample size and potential measurement errors (Infurna et al., 2016; Preuss & Hennecke, 2018). A meta-analysis is needed to contribute to recent research into the possibility of personality change over the lifespan (Roberts & Mroczek, 2008; Roberts et al., 2006) and to prompt the development of potential new clinical interventions to help those affected.

Limitations to existing research

Sampling. Some studies consider unemployed school leavers (Layton, 1987; Winefield & Tiggemann, 1990), while others look at mature workers (Linn et al., 1985; Preuss & Hennecke, 2018) or at specific sub-groups

such as blue-collar workers (Frost & Clayson, 1991). Generalisations from these groups lack external validity due to difficulties in separating confounding variables. Young people, for example, are less prone to experience the financial hardship and social strain of unemployment in the same way as older workers (Winefield & Tiggenmann, 1990; Caleb & Relajo-Howell, 2019) and several studies have found unemployment in mid-life to be more stressful than unemployment among school leavers (Lachman, 2004; Schmitz, 2011), possibly due to the effects of unemployment on family life and on meeting basic survival needs.

Employment status during assessment. Studies that have looked into the effects of unemployment on locus of control often fail to control for participants' employment status at time of assessment. Of longitudinal studies that assess change in locus of control over time, some make a first assessment following job loss (e.g., Shamir, 1986; Jackson & Warr, 1984) while others assess locus of control before unemployment (e.g., Diwald, 2007; Goldsmith et al. 1996; Legerski et al., 2006). Of those that do assess locus of control prior to job loss, in some studies participants are aware of impending job loss (e.g., Layton, 1987) while others use data that was collected before awareness is probable (e.g., Preuss & Hennecke, 2018). Further, at second assessment, participants are sometimes reemployed and sometimes still unemployed (see Preuss and Hennecke, 2018).

Assessment timing. There is no consistency between studies as to when locus of control is assessed. Winefield et al. (1988) make assessments among students still to leave school and then again after four years while Infurna et al. (2016) look at data collected over two years. Studies that have assessed change in locus of control following job loss have found different results depending on when assessment was conducted. Legerski et al. (2006) find no change in locus of control six months after job loss but an increase in internal beliefs a year later.

Aims. This meta-analysis is an attempt to understand whether there is a reciprocal relationship between locus of control and life events, with locus of control not only able to predict employment experiences (Chen & Silverthorne, 2008; Karabay et al., 2016; König et al., 2010) but being in turn affected by employment experiences.

Research questions

This research aims to identify the following: (a) Is there a significant difference in measures of locus of control in people prior to and following unemployment? (b) If there is a change in locus of control following unemployment, is this change most pronounced immediately following unemployment? (c) If there is a change in locus of control following unemployment, is this change more pronounced in older workers as compared with school leavers?

Hypotheses

This study has three hypotheses: (a) There will be a significant difference in locus of control among people prior to and following unemployment; (b) If there is a change in locus of control following unemployment, this change will be most pronounced immediately following unemployment; (c) If there is a change in locus of control following unemployment, this change will be more pronounced in ex-employees as compared with school leavers.

METHOD

Search methods. This meta-analysis was conducted in accordance with MOOSE guidelines (Stroup et al. 2000).

Inclusion criteria. This study set out the following inclusion criteria: (a) Studies must use a longitudinal design; (b) Must use a validated measure to assess locus of control; (c) Must first assess locus of control in participants either in full-time employment or full-time education; (d) Must conduct at least one further assessment of locus of control when participants are both unemployed and out of full-time education; (e) Be published in English.

Exclusion criteria. This study set out the following inclusion criteria: (a) Studies assess only a subset of locus of control beliefs, e.g., health locus of control (Wallston et al., 1978) or economic locus of control (Furnham, 1986).

Because this meta-analysis is assessing the impact of unemployment on locus of control beliefs in both school leavers and among those previously employed, studies were not excluded based on whether participants were aware in the first assessment of upcoming joblessness. In practice this would be difficult to assess. In some studies (e.g., Legerski et al. 2006) it is apparent that workers would be aware of upcoming unemployment, but in many cases participant awareness could only be inferred. Further, there are many moderators which could affect how unsettling this awareness is. Legerski et al. (2006) suggest that uncertainty over whether the steelworks would be reopened led to additional anxieties among former employees, who would postpone job searches in hopes of the plant taking them back on.

Search results. Titles of all search results were assessed and those clearly unrelated were discarded. Where titles referenced employment, unemployment, job loss, or locus of control, abstracts and measures were reviewed to see if they met inclusion criteria. This produced 36 studies published between 1976 and 2018. These studies were then assessed and marked against the specified inclusion and exclusion criteria. Of these, 12 met the criteria to be included in the final analysis.

Analysis plan. Means and standard deviations for employment and unemployment groups were extracted from included studies and recorded. Where separate means and standard deviations were given for men and women, the mean of the two values was used, weighting for the relative number in each group. In the case of Layton (1987), who reported separate means and standard deviations for school leavers and semi-skilled workers, the mean of these two groups was also calculated. Two studies, Goldsmith et al., (1995) and Goldsmith et al., (1996) reported rate of change. For these studies, the unemployment mean was calculated by subtracting rate of change from the baseline mean.

Where studies reported means and standard deviations for both before and during unemployment, effect size was calculated as Cohen's *d*. In the case of Feather and O'Brien (1986), effect size was calculated from the *F* value and sample size.

These individual effect sizes were combined into an overall effect size as all studies measured the same outcome (Borenstein et al., 2009). A linear mixed effects model was run in R, to assess for the effect of fixed and random effects and to calculate the summary effect size. This accounted for those changes in effect size across studies that were occasioned not by change in employment status but by covariates and sample size differences. Confidence intervals of 95% and standard errors for individual effect sizes were calculated along with *p* values to test the null hypothesis.

Studies were then assigned into one of two subgroups based on whether the second locus of control assessment was made up to or at six months following first assessment or whether after six months. Independently, studies were also divided into two groups depending on whether the initial locus of control assessment was made among students or among those employed. These groups were then used to run moderator analyses to test the hypotheses that former employees experiencing unemployment would undergo greater change in locus of control than former students and that change in locus of control would be greater if the second assessment was made closer to the time of job loss.

Finally, studies were grouped depending on whether they used a version of Rotter's (1966) scale to assess locus of control or whether a version of the Nowicki-Strickland (1973) scale. Although this final moderator analysis was not directly related to research questions, it was hoped that this would explain any observed heterogeneity in results. This final subgroup analysis excluded studies that used other psychometric tests due to data limitations.

Quality assessment. Studies were assessed on an adapted version of the Newcastle-Ottawa scale (NOS) suitable for research using a longitudinal design. This was abridged so that studies could be awarded a

maximum of ten stars, depending on the representativeness of the sample, how well studies controlled for moderating factors, and how the outcome was assessed.

RESULTS

Study and demographic characteristics

The studies included in this meta-analysis were published between 1984 and 2018. Data came from participants across a range of European countries, Australia and America and included results from the German Socio-Economic Panel and the National Longitudinal Survey of Youth. The sample consisted of both former students turned unemployed ($n = 1,425$) and former employees experiencing job loss ($n = 3,750$). Although moderator analyses assessed the impact of unemployment on various subgroups, the total sample ($n = 5,175$) combined data from all studies. Table 1 summarises the characteristics of those studies included in the analysis.

Table 1
Characteristics of included studies

Authors	Year	Population	Measure	Sample Size	Status at First Assessment	Time of Second Assessment*
Feather & O'Brien	1986	School leavers from State high schools in metropolitan Adelaide	9-item abridged version of Rotter's (1966) scale	201	Students	12
Goldsmith et al.	1995	National Longitudinal Survey of Youth	4-item abridged version of Rotter's (1966) scale	1,430	Employees	12
Goldsmith et al.	1996	National Longitudinal Survey of Youth	4-item abridged version of Rotter's (1966) scale	1,457	Employees	12
Layton	1987	Male school leavers and male skilled and semi-skilled workers	Rotter's (1966) scale	287	N/A	6
Linn	1985	Male participants in a Veterans Administration study	Select questions from Holmes and Rahe Social Readjustment Scale	300	Employees	6
Patton & Noller	1984	Australian high school students	Nowicki-Strickland Internal-External Control Scale for Adults	21	Students	5
Preuss & Hennecke	2018	German Socio-Economic Panel	Locus of control questions from SOEP	462	Employees	N/A

Tiggemann & Winefield	1984	Adelaide students aged between 15–17	Nowicki-Strickland Internal-External Control Scale for Adults	761	Students	12
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Table 1 (continued)

Authors	Year	Population	Measure	Sample Size	Status at First Assessment	Time of Second Assessment*
Winefield & Tiggemann	1985	School leavers from 12 schools in Adelaide	Nowicki-Strickland Internal-External Control Scale for Adults	121	Students	24
Winefield & Tiggemann	1990	Adelaide students aged between 15-17	Nowicki-Strickland Internal-External Control Scale for Adults	35	Students	36
Winefield et al.	1988	Adelaide students aged between 15-17	Nowicki-Strickland Internal-External Control Scale for Adults	78	Students	48
Winefield et al.	1991	Adelaide students aged between 15-17	Nowicki-Strickland Internal-External Control Scale for Adults	22	Students	36

*Time of second assessment refers to how many months after first assessment the second assessment was made

Table 2

The results of moderator analyses based on status at first assessment (student or employed), time of second assessment (≤ 6 months after first assessment or > 6 months after first assessment) and psychometric test used (Rotter or Nowicki-Strickland)

Moderator	K	<i>d</i> (95% CI, <i>p</i> value)	<i>Q</i>	<i>I</i> ²
<i>Status at first assessment</i>				
Student	6	0.23 (0.09-0.38, <i>p</i> = 0.002)	19.56	74.44
Employed	4	0.09 (0.02-0.17, <i>p</i> = 0.011)	12.24	75.49
<i>Time of second assessment</i>				
≤ 6 months	2	0.23 (0.15-0.31, <i>p</i> = 0.000)	0.76	0
> 6 months	8	0.17 (0.06-0.27, <i>p</i> = 0.003)	53.77	86.98
<i>Psychometric test</i>				
Rotter	4	0.09 (0.00-0.17, <i>p</i> = 0.040)	14.02	78.6
Nowicki-Strickland	5	0.28 (0.12-0.45, <i>p</i> = 0.001)	12.03	66.74

Studies all made a first assessment of locus of control either among students or employees, but just 12% of participants ($n = 601$) were assessed a second time within six months of unemployment while 68% ($n = 4,574$) were assessed a second time once more than six months had elapsed from the initial assessment.

Although all studies used a validated measure to assess locus of control, the exact psychometric test varied from study to study. 65% of the participants included in this meta-analysis were assessed on a version of Rotter's (1966) scale ($n = 3,375$), 20% ($n = 1,038$) were assessed with the Nowicki-Strickland Internal-External Control Scale for Adults and 15% ($n = 762$) used other assessment tools.

The effects of unemployment on locus control

Random effects modelling suggested a small but statistically significant change towards greater externality as a result of unemployment ($d = 0.19$, 95% CI = 0.11-0.28, $p = 0.000$, $k = 12$). Figure 1 shows a forest plot of the data along with effect size as Cohen's d for individual studies.

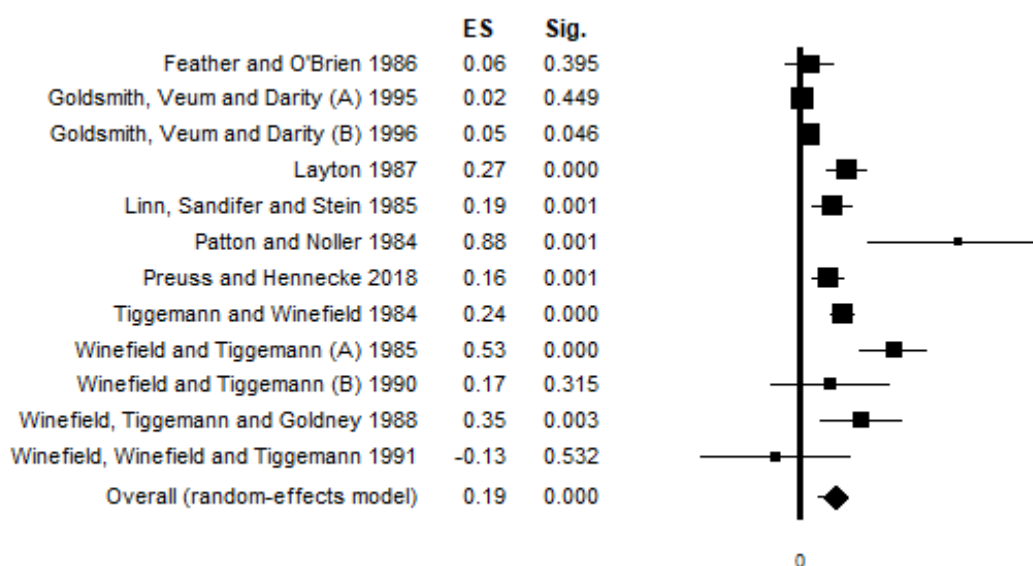


Figure 1
Forest plot showing effect size in Cohen's d and p values as calculated by random effects modelling

However, due to significant heterogeneity across studies ($Q = 73.45$, $I^2 = 85.02$) suggesting a high degree of inconsistency, random effects modelling was rerun without including Patton and Noller (1984). This was the only study that revealed an effect size > 0.80 , but was questionable due to wide confidence intervals (95% CI = 0.38-1.39) and methodological flaws observed in the quality assessment. Patton and Noller (1984) provided no justification for their sample size, which was of particular concern given that this was the smallest sample of all those included in this meta-analysis and because no description of their sampling procedures was provided.

When random effects modelling was rerun without including results from Patton and Noller (1984) a smaller effect size was observed ($d = 0.18$, 95% CI = 0.09-0.26, $p = 0.000$, $k = 11$) but heterogeneity was improved ($Q = 64.57$, $I^2 = 84.51$).

A funnel plot of the data did not show any significant asymmetry and there was no suggestion that results had been influenced by publication bias.

Moderator analyses

The results of the moderator analyses are illustrated in Table 2. Moderator analyses suggested that there was a significant change in locus of control whether first assessment was made among those who were employed ($d = 0.09$, 95% CI = 0.02-0.17, $p = 0.011$, $k = 4$) or among students ($d = 0.23$, 95% CI = 0.09-0.38, $p = 0.002$, $k = 6$) but that this change was more pronounced in the latter group. Among students a larger effect size of $d = 0.23$ can also be observed.

Conducting a second assessment ≤ 6 months after the first led to a more significant change towards externality ($d = 0.23$, 95% CI = 0.15-0.31, $p = 0.000$, $k = 2$) than having the second assessment completed > 6 after the first ($d = 0.17$, 95% CI = 0.06-0.27, $p = 0.003$, $k = 8$) and the effect size was also greater. However, this analysis was based on just two studies with a small, combined sample size ($n = 587$).

Despite hopes that further sub-analyses based on psychometric tests would explain heterogeneity, high statistical heterogeneity was observed both among those studies that used a version of Rotter's (1966) scale ($Q = 14.02$, $p = 0.003$, $I^2 = 78.60$) and among those that used a version of the Nowicki-Strickland (1973) scale ($Q = 12.03$, $p = 0.017$, $I^2 = 66.74$).

Further sensitivity analyses were undertaken to see whether quality concerns were affecting these results. Figure 2 shows the effects of removing any single study from the overall analysis; as can be seen, the result remains small but statistically significant regardless of any one study being removed from this analysis. The omission of either Goldsmith et al. (1995) ($d = 0.20$, 95% CI = 0.11-0.29, $p = 0.000$, $k = 10$) or Goldsmith et al. (1996) ($d = 0.20$, 95% CI = 0.10-0.29, $p = 0.000$, $k = 10$) would lead to an effect size of ≥ 0.20 , the threshold for what is often considered a small change (Cohen, 1988). However, these studies both received acceptable quality ratings and had the largest sample sizes of any studies included in this analysis. Excluding all studies that received a quality assessment rating of < 6 stars (Layton, 1987; Linn, 1985; Patton & Noller, 1984; Winefield & Tiggemann, 1985) still led to a small but statistically significant change in locus of control being recorded ($d = 0.12$, 95% CI = 0.03-0.20, $p = 0.004$, $k = 8$).

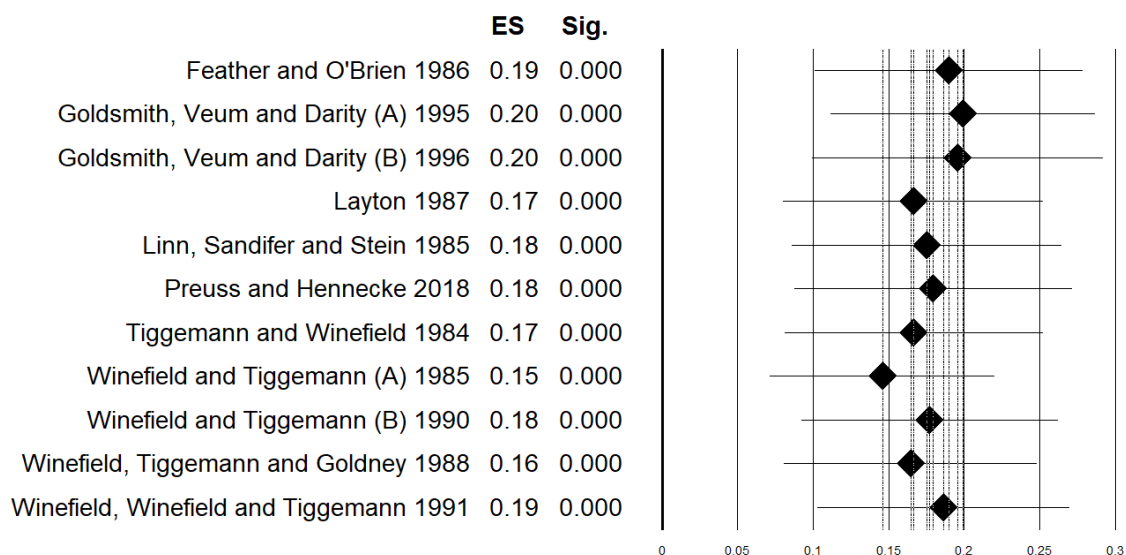


Figure 2

The results of a sensitivity analysis for random effects showing overall effect size and significance should an individual study be excluded

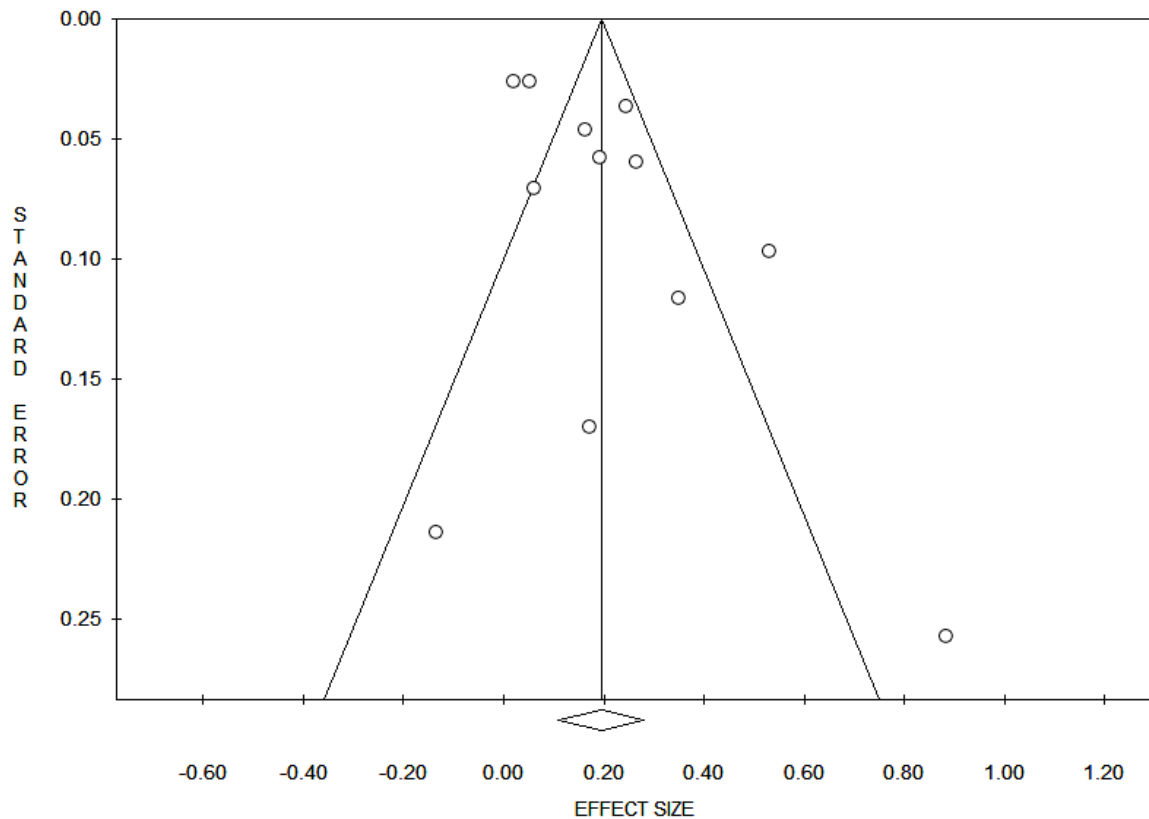


Figure 3
Funnel plot of included studies

Quality assessment

Studies that accounted for all the methodological considerations could be awarded a maximum of ten stars. However, the studies in this meta-analysis had quality ratings of between three (Linn et al., 1985) and eight (Preuss & Hennecke, 2018) stars.

Across studies, there was a consistent failure to provide any justification for the reported sample size. Preuss and Hennecke (2018) was the only paper that justified its sample size, while other studies (Goldsmith et al. 1995; Goldsmith et al., 1996) had large samples of over a thousand participants but still reported no power analyses.

This was not the only common failing relating to sampling. In several studies (Winefield & Tiggemann, 1985; Winefield & Tiggemann, 1990; Winefield et al. 1988) no description of comparability between respondents and non-respondents was offered and neither Layton (1987) nor Patton & Noller (1984) explain how sampling was undertaken.

Due to studies having to assess locus of control using a validated psychometric test, all studies relied on self-report measures and so only received one star for this section.

DISCUSSION

The results of this meta-analysis show a small but statistically significant change in locus of control, towards greater externality. This supports the general consensus on the effects of unemployment on control beliefs and confirms the results of studies both included and excluded from this meta-analysis. However, up to now, these conclusions have often been reached from studies with small sample sizes and unacknowledged methodological limitations.

An unexpected finding was that students entering unemployment showed a greater change in locus of control scores than did those who were employed prior to job loss. However, these results should be treated with caution given that 77% of the sample employed at time one ($n = 2,887$) came from two studies by Goldsmith et al. (1995; 1996). Further, the results of an ANOVA between these two groups revealed that this difference did not exceed that which might be expected by chance. That said, the result of this ANOVA could be compromised because of variance in mean occasioned not by between-group differences in locus of control but because of variation caused by the range of assessment tools.

As was hypothesised, those who were assessed a second time within six months of job loss exhibited a more significant change towards externality than did those who were assessed after six months had elapsed. This is what would be expected from viewing these results through the hedonic treadmill model (Lyubomirsky, 2010). Despite this, it is important to note that this analysis consisted of just two studies (Layton, 1987; Linn et al. 1985), both of which had unjustified sample sizes. It is interesting that this was the only sub-analysis that resulted in low levels of heterogeneity despite Layton (1987) assessing change in locus of control among both employed groups and among students. Coupled with the high heterogeneity seen elsewhere this suggests that more significant moderators exist outside of the confines of this meta-analysis.

It should also be noted that due to limited papers the analysis of studies that conducted a second assessment after six months or more had passed included both papers that made a second assessment after twelve months and those that made a second assessment after 24 months or longer. This could make more subtle changes over time difficult to observe. For example, Legerski et al. (2006) noted an increase in internal control beliefs a year after unemployment, which they suggested was a result of former employees coming to accept job loss and realising they could cope. It could just as easily be understood through the hedonic treadmill model (Lyubomirsky, 2010) and be the result of control beliefs returning to a baseline level. It is unclear whether these beliefs would remain stable over even longer periods of unemployment or whether further fluctuations would be observed.

The effect of the interaction between student status at time of first assessment and having a second assessment conducted ≤ 6 months after the first was considered for further tests. It was thought that due to both of these results being significant a notable interaction could be found. It is worth noting that while this analysis could not be run due to a lack of data, the only study that did explore this interaction was Patton and Noller (1984) who observed the largest effect size of any of the studies included in this meta-analysis. While this does not undermine the decision to exclude this paper from further analysis due to wide confidence intervals and methodological issues it again suggests an avenue for further research.

The observed heterogeneity offers some explanation for the small observed effect size, despite a significant overall p value. Several of the studies included in this meta-analysis have both narrow confidence intervals and contribute significant results (e.g., Layton, 1987; Linn et al., 1985; Preuss and Hennecke, 2018; Tiggemann and Winefield, 1984) but those studies with the largest sample sizes have both narrow confidence intervals and find no significant effect (Goldsmith et al. 1995) or results that are only just significant (Goldsmith et al. 1996). Excluding those studies with the widest confidence intervals (Patton and Noller, 1984; Winefield and Tiggemann, 1990; Winefield et al. 1988; Winefield et al. 1991) still results in a significant change in locus of control, but an effect size below the 0.20 that Cohen (1988) considered small.

Implication for future research

One of the priorities for future research should be to make sense of the high heterogeneity found in this meta-analysis and to establish the moderator variables that effect change in locus of control. It can be imagined that if heterogeneity remains high even among a meta-analysis then this is even greater in wider practice where there is notable clinical heterogeneity between studies.

These results suggest that focusing on time of second assessment might be a good starting place. There was high heterogeneity in the moderator analysis for papers making a second assessment over 6 months had elapsed, but this might have been expected since this included both studies that made a second assessment after twelve months (e.g., Feather and O'Brien, 1986) and papers that made a second assessment after several years had elapsed (Winefield et al., 1988). The only moderator analysis that revealed low heterogeneity was that assessing studies making a second assessment ≤ 6 months after the first. However, it should be noted that this result was found from an analysis of just two studies. An understanding of how assessment timing effects change in locus of control would also be helpful for guiding potential clinical interventions to help those experiencing job loss.

CONCLUSION

This analysis reveals that in addition to the already well-documented physical and mental health consequences of unemployment there exists a tendency towards external locus of control beliefs. In appraising the results of a broad range of studies, this meta-analysis supports individual results that have found this effect and shows the move towards a more external locus of control to be consistent even once methodological and sampling concerns have been addressed. In doing so it prompts the need for greater consistency across future studies so as to better understand the moderators that influence the degree to which this change is observed.

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