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## Irish language self-efficacy beliefs: Mediators of performance and resources



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### Abstract

Self-efficacy, the system of beliefs that individuals possess which enables them to exercise control and actions when faced with a specific task, is an essential component to language learning, as it has the potential to promote the self-regulatory capacity required for successful language acquisition and performance. One way in which self-efficacy mediates language learning is exhibited in how individuals dedicate resources such as effort and time to overcoming tasks. The aim of this study was to determine the influence of Irish language self-efficacy beliefs on performance and resources allocated by Irish adults ( $N=450$ ) on an Irish language reading test. Over two testing phases, three groups were formed based on results in phase one: a control group; a group of high performers; and a group of low performers. Manipulated comparative feedback and false results produced highly significant effects on performance and resources allocated, with low performing participants receiving a positive intervention consisting of false inflated results, leading to improved performance and increased time dedicated to task completion. High performers who received a negative intervention consisting of falsely deflated results saw a significant decrease in performance and the time allocated post-manipulation. The control group also saw a decrease in average performance scores, making the low performing group's performance even more noteworthy. Overall, findings show that self-efficacy beliefs, though initially closely aligned with actual performance, can in fact be manipulated to influence performance outcomes.

**Keywords:** self-efficacy, Irish language, manipulation, minority languages, perceptions

### Introduction

The Irish language is a compulsory school subject in Ireland, with the majority of adults having experienced over 2,300 hours of formal, classroom tuition by the time they complete the full education cycle, at age 17 or 18 years (Ó Laoire, 2005). Despite this amount of exposure, over 60% of the adult population self-declare as having no speaking ability – the only metric used to measure Irish language competence in the Census of Population (CSO, 2018). A single question lacks the

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nuanced gradations required for determining the multi-faceted skills required for language competence. Census data trends reveal self-declarations in Irish language abilities to be stable, only demonstrating very slight fluctuations in the number of self-declared Irish speakers recorded every five years. Self-efficacy, which looks at perceptions of abilities at a task-specific level, may provide a more appropriate approach to assessing language abilities that is lacking in the State's current approach to gathering Irish language data. Furthermore, if self-efficacy interventions prove significant, then there may be opportunities to demonstrate to self-assessed non-speakers of Irish that perceptions of Irish language loss may be mis-calibrated. To date investigations into Irish language self-efficacy, and its mediating influence of performance have been very limited, and confined to qualitative studies (Barry, 2020). The only research into Irish self-assessment and task alignment related to Irish language acquisition has been conducted with a small sample size and with students aged around 12 years (Dillon, 2016).

## Literature Review

### Self-efficacy

Self-efficacy, the central concept of Bandura's (1977) social cognitive theory, represents the system of beliefs that individuals possess which enables them to exercise control and actions when faced with a specific task (Mills et al., 2007). Perceived ability to perform a target behaviour has been shown to be a better predictor of performance than ability, previous success, or constructs such as self-concept or self-confidence (Bjorklund et al., 2020; Hendricks, 2014; Schunk, 1991). As perceived self-efficacy is not a measure of skill, but the beliefs held about what one can do with those skills under specific circumstances, that is, the potential performance, individuals are more likely to perform tasks they perceive themselves capable of accomplishing and are less likely to engage when tasks appear to be beyond their competencies (Zeldin & Pajares, 2000).

Self-efficacy acts as a contributory motivational component to the individual difference variables that determine success in language learning (Dörnyei, 2005; Schunk, 1981), often acting as a mediator of attitude and engagement (Tremblay & Gardner, 1995). With Moreno and Kilpatrick (2018) demonstrating how second language usage improves efficacy beliefs, the impact of efficacy-lowering variables such as anxiety only leads to a withdrawal from the communicative process, as well as a lowering of overall efficacy perceptions in the linguistic domain. A further issue in the second language learning domain is that individuals over-estimating the capacity to achieve a task will become demoralised with repeated failures, while those that underestimate abilities potentially avoid developmental opportunities (Schunk, 1981).

Second language investigations have already established relationships between self-efficacy and L2 achievements, learning strategies, self-regulation, and reading and listening proficiency (Graham, 2006; Mills *et al.*, 2006; Mills *et al.*, 2007). Using multiple regression analyses, both Hsieh and Kang (2010) and Mills *et al.* (2006) demonstrated self-efficacy as a significant predictor of L2 achievement. An investigation into English L2 pronunciation skills and learning strategies conducted by Sardegna et al. (2018), utilising confirmatory factor analysis modelling, found that learners' self-efficacy positively related to efforts to improve pronunciation, while negatively relating to anxiety, worry or nervousness. Self-efficacy's relationship to self-regulation, and subsequently performance, was demonstrated in Saito (2020), while L2 teacher self-efficacy has been shown to correlate positively with vocational responsibilities such as promoting L2 values and learning in general (Swanson, 2012).

### **Self-efficacy-performance relationship**

Recent discussions have emerged on the causality and direction of self-efficacy, and whether self-efficacy is a driver of future performance or a result of previous, past performances. Control theory (Powers, 1991) – which considers how confidence and performance evolve over periods of time - challenges social cognitive theory's widely held belief that the self-efficacy-performance relationship is by default positive, in suggesting that this relationship can be positive, negative, or null depending on how self-efficacy beliefs have been constructed (Vancouver & Kendall, 2006). For example, an individual with high self-efficacy may actually underperform due to over-confidence or disinterest if the task is not challenging. A meta-analysis of 38 self-efficacy studies at the within-subjects level, conducted by Sitzmann and Yeo (2013), shows that correlations between past performance and self-efficacy are positive and more significant when compared with self-efficacy and future performance relationships. This finding is supported by findings in Lindsley et al. (1995), where self-efficacy is established as the cumulative assessment of previous performances, be they failures or successes, and is in fact, self-correcting, thus recalibrating to what appear to be embedded beliefs. This theoretical approach suggests that self-efficacy is primarily a product of past performances rather than a mobiliser of future performances and is not as dynamic as previous empirical evidence suggests.

### **Sources of linguistic self-efficacy**

The differences between an individual's perceptions of their second language self-efficacy and their actual competency levels are the result of a complex process of self-persuasion that relies on the cognitive processing of four sources of influence: enactive mastery experience – encompassing perceptions of previous performances; vicarious experiences – experiences with social modelling and social comparison; verbal persuasion – reinforcing or devaluative feedback; and physiological and affective states – the emotional reaction triggered when faced with a task (Bandura, 1986; Bandura, 1995). Mastery experiences are the beliefs based on previous experiences with the target language and are regarded as the strongest source. They provide authentic evidence for individuals, with successes raising efficacy beliefs, while failures lowering them (Bandura, 1997). A raw performance score is not necessarily the only source of mastery experience. For example, the pass/fail culture within the school or region, or how an individual interprets experiences all contribute to the influence of these previous performances on L2 learners (Chan & Lam, 2010).

Vicarious experiences are derived from two sources of information: social comparison with peers, and modelling. When individuals have little knowledge or experience needed for judging their capacity to complete a task, observing the success or failings of others of similar capabilities becomes a highly influential source of self-efficacy, on occasion impacting more directly than a comparative language-related enactive mastery experience (Barry, 2020). An individual's adequacy is generally judged in relation to a normative comparison with the performance of others (Bandura, 1997). When direct knowledge of capabilities is absent, individuals rely more heavily on modelled indicators. Students will often seek out models with a level of task competency to which they aspire – often represented by their status, power, or prestige, such as a teacher (Usher, 2009).

Social or verbal persuasion is a common, indirect source of self-efficacy, usually exhibited as feedback and encouragement from peers or models such as a teacher or parent (Bandura, 1997). According to Zeldin and Pajares (2000), social persuasion is balanced more towards having the power to undermine efficacy beliefs than strengthen them. This is particularly significant in academic settings where teachers and peers are the immediate sources of social persuasion, with teachers establishing evaluative standards that have the power to determine a student's mastery

experience (Chan & Lam, 2010).

Situations that elicit emotional arousal provide informative value to individuals assessing competencies. It is the interpretation of this somatic information, and not the physiological state itself that individuals infer as evidence of debilitating-arousing influences (Bandura, 1997). Interpretations are often weighted towards the outcomes of previous mastery experiences, with high-efficacy learners likely to find moderate affective arousal beneficial, while low-efficacy learners find the same prompts debilitating in nature. L2 performance phenomena, such as foreign language anxiety (Horwitz *et al.*, 1986), have been shown to manifest in low efficacious learners much more so than in highly efficacious learners (Torres & Turner, 2016).

### Resource allocation

According to Beck and Schmidt (2012, p. 206), “motivated behaviour is essentially a series of decisions about where to allocate resources and how many resources to allocate”. In this context, self-efficacy can be categorised as a form of goal-directed expectancy involving a negative feedback system in which individuals identify the discrepancy between perceived abilities and the resources required to reach the target goal (Bandura, 1993; Stirin Tzur *et al.*, 2016). Allocating resources such as time and effort to overcome challenges is a key characteristic of high self-efficacy language learners and is related to self-regulation – a significant predictor of second language success (Mills *et al.*, 2007). When resources are perceived as being unavailable due to low self-efficacy beliefs, negative associations develop with the second language as the discrepancy between current and desired states increase (Piniel & Csizér, 2013). While resource allocation and self-efficacy are regarded as being positively related, recent studies have provided contrary evidence, suggesting that increased self-efficacy can actually reduce resources as individuals believe discrepancies are minimal, while negative efficacy perceptions lead to adaptive behaviours that seek to improve performance. For example, in Beck and Schmidt (2015), participants were randomly assigned to two conditions, scarce time and abundant time, for completing a maths test (42 questions divided equally over six blocks). The time scarce condition allowed participants to freely allocate the seven minutes allotted for solving each block. Results show that self-efficacy has a negative relationship with resource allocation under the time scarce condition, with low-efficacy participants allocating more time per question in an attempt to achieve at least a minimal level of performance, while high-efficacy participants, confident in abilities, tend to allocate much less time per question. However, in the time abundant condition, a positive relationship emerges, where participants with high self-efficacy seek to achieve higher results through increased resource allocation. While results demonstrate a negative relationship in the time scarce condition, it is difficult to determine the potential influence of confounding variables such as test strategy or confidence, where high-efficacious individuals are willing to take risks where parameters such as time are restricted. Furthermore, it may be difficult to generalise findings from the study in a second language context, as individuals are unlikely to experience abundant time conditions when it comes to using a language.

Vancouver *et al.* (2008) consider a number of empirical self-efficacy motivation models related to resource allocation, advocating for a discontinuous model in a study involving participants determining time required to click on moving computerised boards. This model demonstrates that individuals with initial low levels of self-efficacy, matched with low levels of motivation, can be directed into allocating resources if enactive mastery experiences are positively affected through manipulation. Similarly, Beck and Schmidt (2012) suggest that the self-efficacy and resource allocation relationship is non-linear, and that individuals occupy a dynamic self-efficacy “location” at the within-person level that is task-dependent. For example, an individual with initial low

self-efficacy may take on the challenge of the task, allocating necessary resources to achieving a goal. If the individual believes they are making incremental progress they may choose to place even more resources into the task. As the individual begins to grow in task confidence, they may begin to feel that they no longer need to allocate as many resources to achievement, and thus withdraw further effort or time.

### **The Irish language context**

In Ireland, the Irish language, along with English, is designated as one of two official languages in the Constitution. English is the dominant language in the State. Every 5 years, a Census of Population is carried out to gather information on all individuals and households in the State (CSO, 2020). The Irish language section of the Census is comprised of two questions – an omnibus question on whether you can speak Irish or not, and a follow-up question on frequency if you self-declare as being an Irish speaker. This provides the only official, population-wide metric for directing Irish language policy for the Government.

The Irish language is a compulsory, core school subject for all children in Ireland, with over 2,000 classroom hours over 14 years dedicated to the teaching of the language (Ó Laoire, 2007). The vast majority of adults in Ireland will have taken the terminal examination – the Leaving Certificate – usually at age 17 or 18 years. The Irish subject is offered at three levels: Foundation; Ordinary; and Higher and includes a separate oral element worth 40% of the overall marks (State Examinations Commission, 2019). A pass grade in Irish still remains a prerequisite for attending one of the six National Universities of Ireland. Despite the number of classroom hours dedicated to teaching the language, the 2016 Census returns show that over 60% of adults aged 18-years and over claim to have no Irish speaking abilities (CSO, 2018). Studies into perceived second language loss have shown how learners tend to overestimate their inabilities in a second language that hasn't been used since leaving the school system (Bahrack, 1984; Weltens, 1989). In the Irish language context, this concept of perceived loss has been investigated to show that despite low ability perceptions, Irish language knowledge remains for a period of time outside the education system (Murtagh, 2007; Murtagh & van der Slik, 2004). However, these Irish language perception studies have been conducted in the context of recent school leavers, thus leaving a gap in research investigating adults' Irish language beliefs, which this study aims to address.

### **The Present Study**

The present study aims to investigate the mediating effect of manipulated self-efficacy on performance and resource allocation in Irish adults on an Irish reading test. With previous performances representing the most authentic source of self-efficacy beliefs, it is anticipated that by manipulating these mastery experiences, the amount of resources allocated, as well as the subsequent performance itself, will be affected. As the current Irish Census language questions has remained unchanged since 1996, and for non-speakers of Irish is likely to be the only occasion for self-assessing language skills since finishing school (McCloskey, 2001), it merits investigating whether task performance aligns with more specific pre-test confidence ratings. Finally, with periods of non-use linked to under-estimations of Irish language ability (Murtagh, 2003, 2007; Murtagh & van der Slik, 2004), it is worth investigating the significance of age on Irish self-efficacy beliefs. To this end, the following research questions will be undertaken:

1. Do Irish language reading self-efficacy beliefs reflect performance and the time allocated to a test?
2. Does age have a mediating role in Irish language reading self-efficacy declarations?

3. Do manipulated self-efficacy beliefs impact on subsequent performance?
4. Do manipulated self-efficacy beliefs impact on resource allocation?

## Method

### Procedure

A combined questionnaire and test instrument, outlined below, were administered via an online survey platform, Qualtrics. This allowed participants to autonomously take part in the research in their own time. Following briefing information, participants were asked to indicate informed consent by ticking a box on the screen. Basic demographic information was elicited, followed by an eight-question self-efficacy scale. Participants were then administered ten multiple-choice questions aimed at testing Irish knowledge. Based on results, participants received either actual or false results, and were automatically assigned to control or intervention groups. This was followed by a final set of ten multiple-choice questions testing Irish knowledge. Once reaching the end of the survey, participants were informed of the manipulation and provided with their correct results, where applicable. The option to revoke consent was then provided.

### Self-efficacy

To test participants' self-efficacy of Irish reading skills (SER) - the closest representation of skills required for the multiple-choice questions on the test (outlined below) – a reading skills self-efficacy sub-scale that was created and piloted in a previous unpublished study with 90 participants, was used. In the pilot study, SER achieved significantly high internal consistency scores ( $\alpha=.96$ ). SER comprised of eight statements ranging from “I am able to identify basic words in a simple text” to “I am able to extract the relevant points from a number of complex sources” - and aimed to represent the different level of reading abilities. Statements were modelled on similar ability scales used for Irish surveys (Darmody & Daly, 2015) and French self-efficacy studies (Mills *et al.*, 2007). Using Bandura's (2006) guidelines that statements should be based on confidence ratings, allowing for absolute zero, participants were provided with six Likert-scaled response options in intervals of 20% ranging from “0% - no confidence” to “100% - complete confidence.”

### Irish test

A multiple-choice reading test, consisting of 20 declarative statements or sentences, each with three options – one of which formed the correct answer, was used. A combination of grammatical and vocabulary knowledge is required to correctly form the sentence. For example, “Tá mé i Baile Átha Cliath/ mBaile Átha Cliath/ Bhaile Átha Cliath inniu” (I'm in Dublin today) requires an understanding of spelling changes brought about by preposition and eclipsis. The test was developed by Neachtain (2018) using a current corpus of Irish language to highlight the most common errors made by students and was designed to test new student teachers of Irish. It is based at an intermediate B1 level on the Common European Framework of Reference for languages (CEFR), a level that is loosely aligned between the upper-ability of the Ordinary and lower-end of the Higher-level Irish Leaving Certificate (Ní Mhaonaigh, 2013). Statements are modelled on typical phrase structures encountered in written texts in the school curriculum. The original test was comprised of 25 multiple-choice statements. Following pilot testing for a general population, using random sampling of 104 participants, the test was analysed using item discrimination and difficulty indices. Five statements were removed for reasons such as too many participants getting an item correct, or an item not distinguishing between higher and lower language ability levels. The test was then divided into two sets of 10 multiple-choice statements (Phase 1 and Phase 2), with the

distribution of difficulty appearing to be even across both phases based on the pilot testing.

### **Participants**

A general call to anonymously participate via a web link to an online survey and test was issued across various social media platforms, with the survey instrument open for a one-week period. One of the main criteria was that participants had completed the Irish language Leaving Certificate, thereby ensuring that participants had experienced the compulsory Irish language school cycle, as discussed above. Basic demographic information was taken for each participant. Informed consent was sought at the beginning of the survey and test. 681 participants began the survey and test, with 514 participants fully completing it. Following the Phase 2 test, participants were informed of the manipulation procedure, and three participants took the opportunity to revoke their informed consent. During the analysis phase, it emerged that one of the Phase 1 questions had two potentially correct answers, based on whether the participant correctly identified the Munster or Ulster Irish language dialect option. The original test instrument had been based on testing participants with a Munster dialect education background. As Phase 1 results auto-triggered whether participants received either their actual or manipulated results, 55 participants were affected by this error and removed from the data set. A further 6 participants were removed due to unusual test times (those taking under 30 seconds or over 10 minutes to answer the first phase 10 MCQs) The final dataset comprised 450 participants (150 males, 298 females, 2 non-binary).

### **Manipulation procedure**

In order to test the effects of self-efficacy on performance and resource allocation, a manipulation intervention was established involving false results and false comparative feedback. Performance was operationalised as the results from each phase, while resource allocation was operationalised as the time taken in seconds to complete each testing phase. Participants were not informed that the test was being timed. Based on Phase 1 results, three groups were formed. Those that correctly answered either 3, 4 or 5 questions out of 10 were automatically assigned to the “low” group (n=113). They were falsely informed that they received 7 out of 10 and a message stating this was above the level of other participants. Those that correctly answered either 6 or 7 questions out of 10 were provided the false score of 4 out of 10 and informed this was below the level of other participants – forming the “high” group (n=75). A control group (n=262), receiving actual results and no comparative feedback, comprised participants that got between 0 and 2, and between 8 and 10 questions correct out of 10. The reasoning was that those in the highest and lowest result brackets would likely have a more realistic indication of their level, while those in the middle range of results could potentially be more susceptible to manipulation. It is important to note that the control group only contained 12 participants that scored between 0 and 2 out of 10, thereby effectively comprising a vast majority of high performers. It was anticipated that the false comparative feedback and manipulated results would have an effect on Phase 2 performance and resource allocation.

### **Data analysis**

All analyses were conducted with the statistical programme R (R Core Team, 2020). The afex package (Singmann, Bolker, Westfall, Aust, & Ben-Shachar, 2020) and the emmeans package (Lenth, 2020) were used to carry out the ANOVA tests, and follow-up testing. The base R package (R Core Team, 2020) and psych package (Revelle, 2020) were used for all other statistical analyses. A visual inspection of the Phase 1 and 2 results and time taken variables, and an inspection of skewness, revealed that the time taken data were not normally distributed. A transformation of the time taken data was performed to correct for distributional extremities. A follow-up check on the transformed data revealed a very small number of remaining outliers. As the manipulation effect is

based on potentially significant changes between Phase 1 and 2, the identified outliers were checked on an individual case-wise basis to determine if extreme data were due to either the false feedback intervention or were consistent with an individual's time taken or results on both phases. As this appeared to be the case, the decision not to remove any further outliers was taken. The process is discussed further below.

## Results

### Self-efficacy, performance, and resource allocation

The reading self-efficacy scale (SER) was verified for internal consistency using Cronbach's alpha ( $\alpha=.97$ ), demonstrating robust internal consistency. A composite percentage score was created for both SER by averaging the responses for each participant. To investigate the perceptions of Irish language reading ability and whether they align with performance and time allocation on Phase 1, correlations were calculated for all participants. Pearson's correlation coefficient for SER and Phase 1 results emerge as statistically significant and highly positive ( $N=450$ ,  $r=.69$ ,  $p<.001$ , 95% CI[0.63, 0.73]). Pearson's correlation coefficient for SER and time allocated in seconds emerged as negative, weak and statistically significant ( $N=450$ ,  $r=-.16$ ,  $p>.001$ , 95% CI[-0.25, -0.07]).

### Self-efficacy and age category

Self-efficacy percentage means by age category were tested for significant differences. Four age categories were established: 18-29 years ( $n=113$ ,  $M=81$ ,  $SD=20.13$ ); 30 to 39 years ( $n=111$ ,  $M=71.4$ ,  $SD=24.5$ ); 40 to 49 years ( $n=121$ ,  $M=67.3$ ,  $SD=26.4$ ); and 50+ years ( $n=105$ ,  $M=70.6$ ,  $SD=18.1$ ). A one-way ANOVA was conducted with age category and SER as the respective independent and dependent variables. A significant difference emerged:  $F(3,452)=9.10$ ,  $p<0.001$ ,  $\eta^2=0.06$ . A post hoc comparison, using a Tukey test, revealed significant differences ( $p<.05$ ) only for the 18-29 years grouping and each of the three other age categories. No other interaction was significant.

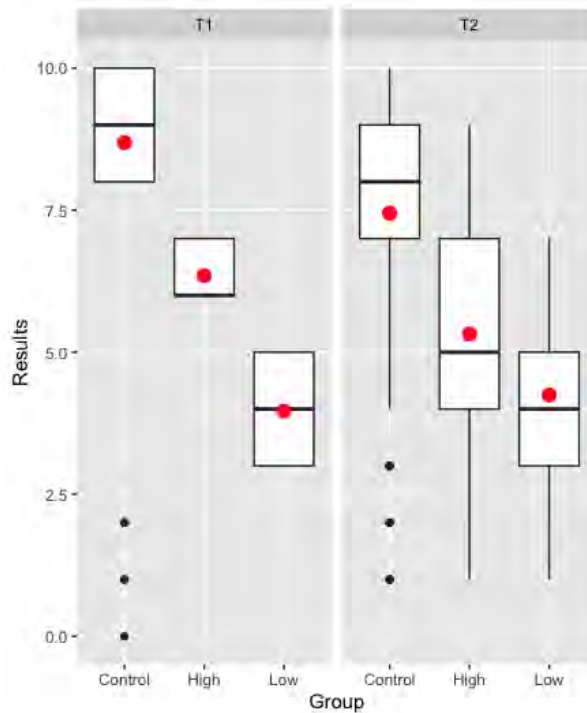
### Manipulation effect

#### *Performance*

To test for the influence of the manipulation intervention on performance across the three groups, a mixed ANOVA was carried out. The intervention effect successfully influenced performance with a significant effect for Group:  $F(2,447)=335.80$ ,  $p<.001$ ,  $\eta^2=.60$ , and a significant effect for Phase:  $F(1,447)=60.37$ ,  $p<.001$ ,  $\eta^2=.12$ . The interaction effect was also significant:  $F(2,447)=37.32$ ,  $p<.001$ ,  $\eta^2=.14$ . Pairwise comparisons demonstrated that performance differences from Phase 1 to Phase 2 were significant for all groups ( $p<.001$ ) except the low group ( $p>.05$ ).

Figure 1 below shows the boxplots for test results for each group between Phase 1 (T1) and 2 (T2). The dot indicates the mean results for the groups. A visual inspection reveals how the mean result for the high group decreased following negative feedback and falsely lowered results. The low group, having received false inflated results and positive comparative feedback, shows an increase in mean results. The control group saw a decrease in performance in Phase 2.





**Figure 1** Boxplots for performance by group across both phases

Table 1 shows how average results for the high group that received the negative intervention decreased by over one mark from 6.35 to 5.32, while the low group – having received the positive intervention, improved from an average score of 3.96 on Phase 1 to 4.25 post-manipulation. Interestingly, the control group, having received actual results and no feedback, saw performance drop from 8.69 to 7.45, making the low group performance increase all the more impressive.

**Table 1** Mean performance results for group performance results across both phases. SDs in parentheses.

	Phase 1	Phase 2
All participants (N=450)	7.11 (2.45)	6.29 (2.27)
<b>High</b> (n=75)	6.35 (0.48)	5.32 (1.68)
<b>Low</b> (n=113)	3.96 (0.76)	4.25 (1.55)
<b>Control</b> (n=262)	8.69 (1.75)	7.45 (1.91)

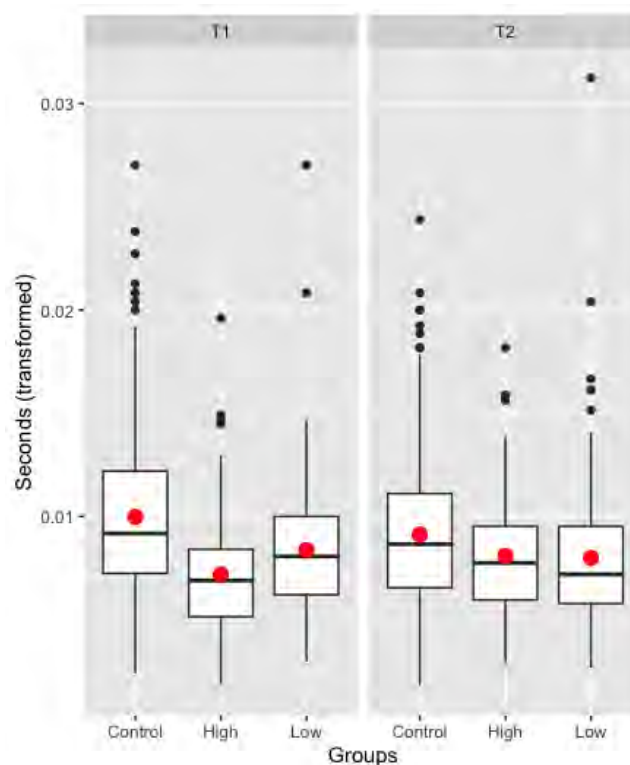
### Resource allocation

As discussed, despite removing extreme outliers in the initial stages and achieving homogeneity of variance, the time data in seconds used to represent resource allocation did not achieve normality. Using boxplots for each group, and the tidyverse package in R for confirmation, almost 30 outliers were identified over both of the phases. This is due to the general non-normality of reaction time data (see Whelan, 2008), and the nature of unrestricted timing conditions in this study. Ratcliff's analysis of the statistical power of different methods for dealing with the effect of outliers suggests adopting an inverse transformation of the data where variability among subjects is low (Ratcliff, 1993). The R

base package was used to carry out the inverse transformation of the data, achieving homogeneity of variance and covariance, as well as the assumption of sphericity. However, outliers still remained in the transformed data. As this study is based on manipulation of results to assess changes in performance and reaction time, potentially leading to increased time at the within subject level, the decision was taken not to remove any further data outliers due to the difficulty in distinguishing spurious from genuine data (Whelan, 2008). Any further attempts to fit the data to a model could potentially weaken the analysis.

To test for the influence of the manipulation intervention on resource allocation across the four groups, a mixed ANOVA was carried out on the inverse transformed time data. The intervention successfully affected the time allocated to each phase of the test with a significant effect for Group:  $F(2,447) = 12.01$ ,  $p < .001$ ,  $\eta^2 = .05$ . The effect on Phase was insignificant:  $F(1,447) = 0.62$ ,  $p > .05$ ,  $\eta^2 = .001$ . The interaction effect was also significant:  $F(2,447) = 12.28$ ,  $p < .001$ ,  $\eta^2 = .05$ . Pairwise comparisons demonstrated that time allocated differences between each phase were significant for all groups ( $p < .01$ ) except the low intervention group ( $p > .05$ ).

The boxplots in figure 2 below show the transformed time taken data for each of the groups on Phase 1 (T1) and 2 (T2). Similar to performance, the manipulation effect influences the amount of time taken in Phase 2.



**Figure 2** Boxplots for resource allocation by group across both phases

Table 2 below shows how average time in seconds taken varied between phases. The high intervention group, who received the negative intervention, withdrew their resource allocation by an average of 26 seconds. The low intervention group, following the positive intervention, allocated more resources (13 seconds on average) to Phase 2. The control group allocated an average of 13 seconds more to Phase 2.

**Table 2** Descriptive statistics for time taken in seconds (resource allocation) across both phases

	Mean		SD		Median		Range (min)		Range (max)	
	Phase 1	Phase 2	1	2	1	2	1	2	1	2
All participants (N=450)	132	138	65	67	118	125	37	32	534	551
<b>High</b> (n=75)	169	143	87	57	145	129	51	55	534	349
<b>Low</b> (n=113)	136	149	51	63	124	139	37	32	338	374
<b>Control</b> (n=262)	119	132	58	71	109	116	37	41	419	551

## Discussion

Before discussing the results of this study, it is important to consider some of the potential methodological limitations. The test instrument comprises only 20 questions related to syntactic and grammatical structures and is likely to only provide a narrower representation of reading ability when compared to other more comprehensive proficiency tests. As this study was intended as a test for an intervention effect, thus relying on participants to continue to Phase 2 with potentially altered self-efficacy, the number of questions needed to be short enough to ensure sustained engagement. Future testing instruments should include an item pool as wide as possible based on the specific linguistic skill being tested yet balanced enough as to not overburden participants. The use of social media as a recruitment tool brings its own set of potential problems regarding representativeness. It is possible that only those interested in the Irish language would have taken part or shared the link to the survey among others with similar interests. Furthermore, Batterham (2014) found that, when compared with postal recruitment, social media recruitment tended to lead to an overrepresentation of female and younger participants. With twice the number of females to males in this study, this issue appears to be evident. One must also be cognisant of the low-stakes, unsupervised nature of the test environment, i.e., it is difficult to assume that none of the participants used a dictionary or online resource to answer questions, thus affecting the resource allocation data. It is recommended that any future L2 manipulation studies of this nature control for time and consider a third testing phase after a period of time, in order to test for the longer-term effects of self-efficacy manipulations.

### Self-efficacy beliefs

This study demonstrates that in line with previous research, self-efficacy is closely aligned with performance. By directly applying this finding to the Irish language context suggests that self-efficacy scales based on percentage confidence levels can provide a robust alternative to single omnibus questions which reduce language self-assessment to a binary categorisation of Irish speaker or non-speaker. Self-efficacy was not found to be a strong predictor of resource allocation. Theory suggests that a stronger negative correlation should have been found as high efficacious L2 users allocate more resources to overcoming challenging tasks, while low efficacious L2 learners tend to avoid these tasks (Bandura, 1997). However, studies conducted by Beck and Schmidt (2015), Vancouver and Kendall (2006) and Vancouver et al. (2008) show that this assumption is worthy of reconsideration. For example, low efficacious individuals may be adapting their behaviours to reach a particular level of performance, thus allocating more resources, or high efficacious individuals, due to overconfidence, may be withdrawing efforts. To fully understand the weak effect size, cultural and sociolinguistic factors may also need to be considered in light of the passive but positive relationship towards the Irish language by those having experienced the compulsory Irish education cycle (Darmody & Daly, 2015). A fuller investigation of this type is beyond the scope of the current study.

For age categories, the 18-29 group represents the highest mean self-efficacy scores in reading and general self-efficacy across all age categories. As participants' age range increases, self-efficacy beliefs decrease, until a slight increase in the 50+ category. This finding underlines language attrition research, which suggests that the longer a person is outside of the education system, their perceptions of their Irish language abilities begins to decrease (Murtagh, 2003).

### **Manipulation effect**

The manipulation intervention proved significant, thus demonstrating the influence of previous performances and comparative feedback on subsequent performances, albeit over a relatively short time period. The effect of positive, comparative feedback and false, inflated results for the low group had a significant effect on both performance (an average increase of .29 marks) and resource allocation (an average increase of 13 seconds). The most striking of the findings is the change in performance and resource allocation in Phase 2 for the control group. Results fell by over 1 out of 10 marks, but more resources were dedicated to Phase 2 – an average increase of 13 seconds. This suggests that items on Phase 2 testing were more difficult for this group (as noted above, 250 participants in this group were high performers, achieving between 8 and 10 marks out of 10 on Phase 1), thereby making the improved performance of the low group all the more impressive. Furthermore, for the high group, the average drop in performance of almost 1 mark out of 10 and allocated resources (average decrease of 26 seconds) suggest a more pronounced effect for negative feedback and deflated results. While this study was limited to measuring pre-task self-efficacy and measuring the effect size of manipulation, further performance factors such as goal orientation, as highlighted in Dahling and Ruppel (2016), should be considered in future intervention studies.

It is difficult to determine the influence of social persuasion on participants in this study. Bandura (1997) suggests that social persuasion relies on the interaction of other sources of self-efficacy. If we consider that enactive mastery experience is the strongest source, and that comparative feedback against an abstract “others” concept compared to a group of known peers may be interpreted differently, it is more likely that false results are the driving force in determining subsequent Phase 2 performance. A future study should consider creating sub-sample groups within each intervention group whereby, for example, half the low group receive false comparative feedback while the other half receive no feedback.

### **Conclusion**

This study represents a first attempt at applying social cognitive theory as a framework for analysing the effects of self-efficacy manipulation on Irish language beliefs. Self-efficacy has been proved to provide an accurate predictor of performance in participants, providing a strong argument for a robust, alternative metric for self-declarations of language abilities in populations. Although self-efficacy seeks to measure the potential performance, the lack of follow-up testing in this approach, may prove methodologically problematic. However, as the current approach is not without its problems (see Darmody & Daly, 2015; Murtagh, 2007), perhaps by providing citizens who have experienced compulsory Irish with the agency to self-declare their confidence on achieving varying language tasks, as opposed to a single declaration of speaking ability, could lead to a deeper engagement with the Irish language self-assessment process.

Furthermore, this study has demonstrated the widely accepted belief that self-efficacy interventions have a direct influence on performance and the resources individuals allocate to tasks (see Marquez et al., 2002; McAuley et al., 1999; Vancouver et al., 2002). This provides an opportunity for educators to consider efficacy-raising interventions during the acquisition phase of Irish. For

example, a previous study on Irish self-efficacy beliefs revealed that a lack of feedback during the acquisition phase has had a profound effect on reducing self-efficacy in Irish adults, leading to capable users of the language withdrawing from any communicative opportunities (Barry, 2020). By introducing regularised, appropriately aligned, formative feedback, or mastery modelling, it is likely that performance factors such as resources allocated, or goal orientations will become positive contributors to future enactive mastery experiences.

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