Can extrinsic rewards induce intrinsic motivation for virtuous behaviour? A classroom-based pilot study

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Abstract

Purpose

This pilot study tested the "lure hypothesis" – the idea that extrinsic rewards can induce intrinsic motivation for virtuous behaviour – within a classroom-based character education context.

Design/Methodology/Approach

Twenty-two extrinsically motivated Year 7 pupils (ages 11–12) from an inner-city comprehensive school were recruited to participate in weekly journaling sessions over six weeks, allocated to either gratitude journaling (intervention) or generic journaling (control). Intrinsic motivation was assessed at three time points using an adapted Intrinsic Motivation Inventory. Data were analysed via mixed factorial ANOVA.

Findings

No significant Group × Time interaction emerged. However, participants in both groups showed a significant increase in perceived autonomy from pre- to post-intervention, suggesting that extrinsic rewards may help initiate internalisation through the formation of habits.

Research Limitations/Implications

As an exploratory pilot with a small, non-random sample and self-report measures, findings should be interpreted cautiously. Future research should employ larger samples and behavioural measures.

Practical Implications

Findings suggest that teachers might use carefully structured reward systems to encourage initial engagement in virtue-related activities, provided attention is paid to the habits being formed.

Originality/Value

This study provides an initial empirical test of the lure hypothesis in an educational setting, showing that rewards may play a productive early-stage role in the internalisation of virtuous behaviour.

Keywords: character education, self-determination theory (SDT), intrinsic motivation, extrinsic rewards, habit formation, lure hypothesis

Introduction

Most would agree that education should prepare children to lead *good* lives. On an Aristotelian understanding, this entails helping them to develop *virtues* – that is, *human excellences* (Aristotle, 2004), which can be understood psychologically as relatively stable dispositional clusters of thought, feeling, and action (Kristjánsson, 2015). Examples of virtues include kindness, bravery, and gratitude (Berkowitz, 2021; Kristjánsson, 2015). A key component of virtue is *motivation*: Aristotle (2004) wrote that an act is virtuous only if it is chosen for its *own* sake (p. 37 [1105a30–34]). Accordingly, many modern programmes of character education place central importance on the cultivation of *intrinsic* motivation (Berkowitz, 2021; Department for Education, 2019; Jubilee Centre for Character and Virtues, 2022; Nast, 2020).

Intrinsic motivation refers to behaviours performed for their inherent satisfactions (feelings of interest or enjoyment). Extrinsic motivation, by contrast, refers to behaviours performed instrumentally as a means to some separable outcome (Ryan and Deci, 2000a).

There are in fact different types of extrinsic motivation, which vary in their relative autonomy (Ryan and Deci, 2000b). This nuance is important because when character educationists stress the importance of "intrinsic motivation," they typically do not refer exclusively to inherently satisfying behaviours, but more generally to autonomous motivation – especially motivation resulting from a process of *internalisation*, where a child has taken an external value and turned it into their own (Berkowitz, 2021; Watts *et al*., 2021). In keeping with these scholars, I also use "intrinsic motivation" in the broader sense.

While intrinsic motivation is widely considered essential for character development, the reality is that many schools rely heavily on extrinsic motivators, especially tangible rewards such as stickers, certificates, and points (Bier *et al*., 2016). This poses a challenge for character education because rewards often *undermine* intrinsic motivation (Deci *et al*., 1999). Character education interventions in schools are therefore especially important, not only because of children's formative developmental stages, but because schools may otherwise constitute motivationally hostile environments for the internalisation of virtue. This situation presents character educationists with a dilemma: either renounce rewards and risk alienating many schools (e.g., Berkowitz, 2022), or embrace rewards and risk instrumentalising character (e.g., Tough, 2013).

Others have suggested a third way: that extrinsic rewards could be used to effectively *lure* initially unmotivated children into developing intrinsic motivation (Watts *et al*., 2021). As yet, there is no empirical evidence to support this proposition (Watts *et al*., 2022). The purpose of the present pilot study was to explore how this gap could be addressed via a classroom-based intervention.

Theory and Hypotheses

According to operant psychology – an advanced form of behaviourism developed by B. F. Skinner (1953) – all voluntary behaviours are ultimately controlled by external

contingencies of reinforcement. On this view, there is no such thing as intrinsic (autonomous) motivation; the term "intrinsic motivation" simply refers to baseline or "operant" behaviours for which the reinforcement contingencies are yet to be identified (Flora, 1990).

One might expect, if all motivation is ultimately external, then extrinsic and "intrinsic" motivation should be *additive*: total motivation should increase with the introduction of a reward and return to baseline ("intrinsic motivation") after the reward is withdrawn (Ryan and Deci, 2017; cf. Scott, 1976). Deci (1971) tested this idea with an experiment where participants worked on interesting puzzles. One group received rewards for each puzzle solved; the other group worked without rewards. Afterwards, participants were left alone with the puzzles among other interesting activities. Findings revealed that the reward group showed a *decrease* in intrinsic motivation compared to the control group: following the introduction and withdrawal of the reward, the level of responding actually went *below* baseline. These findings suggest that not all motivation is external: "intrinsic motivation" is a fundamentally different kind of motivation, which appears to be undermined by extrinsic rewards.

These undermining effects were soon replicated (e.g., Deci, 1972; Ross, 1975), including in educational contexts (Lepper *et al*., 1973). Two decades and over a hundred experiments later, Deci *et al*.'s (1999) meta-analysis confirmed that extrinsic rewards undermine intrinsic motivation. More recently, the undermining effect has also been replicated in the context of moral or "prosocial" behaviour: Warneken and Tomasello (2008) found that rewards undermine very young children's intrinsic motivation for helping others. Ryan and Deci (2017) explain the undermining effect in terms of a shift in motivational orientation: "Whereas initially participants had been doing the activity because it was interesting and enjoyable, those in reward conditions came to view the activity as something they did in order to get a reward" (p. 127).

Motivation is a complex, multi-component phenomenon that has been interpreted through diverse theoretical lenses. Beyond behaviourist and cognitive accounts, contemporary research emphasises the role of emotion and underlying brain processes in shaping motivated behaviour (e.g., Berridge and Kringelbach, 2015; Pessoa, 2017). A full synthesis of these perspectives lies beyond the scope of the present study. However, within educational research on extrinsic rewards, Self-Determination Theory (SDT; Ryan and Deci, 2017) has become the dominant interpretive framework.

When denouncing the use of extrinsic rewards, Berkowitz (2021) draws explicitly on the research of Deci and Ryan – the finding that extrinsic rewards undermine intrinsic motivation (Deci *et al*., 1999). However, this finding applies only to behaviours that are *already* intrinsically motivated (Ryan and Deci, 2000b). Berkowitz's (2021) application of SDT thus seems somewhat misplaced – unless he believes that character education is reserved exclusively for children who are already intrinsically motivated. This view runs the risk of appearing elitist and makes character education largely redundant: for children who are intrinsically motivated toward virtue already have good character. However, it is clear from his discussion of internalisation that Berkowitz (2021) does not only have such a privileged few in mind: he is chiefly concerned with children who are yet to begin internalising virtues. But how does one motivate unmotivated children? Could rewards have a use? This is a critical question for character education, one to which SDT's findings do not apply – not as Berkowitz (2021) applies them, at least.

It is important to note that critiques of extrinsic motivation within SDT – and in Berkowitz's (2022, 2021) work in particular – are primarily directed at tangible, contingent rewards (e.g., points, prizes, certificates), rather than at all forms of external support. Berkowitz does not reject the role of structured activities, recognition, or informational feedback in education, all of which may support competence and internalisation when

delivered in autonomy-supportive ways (Ryan and Deci, 2017). However, the present study is concerned specifically with the use of tangible reward contingencies to initiate engagement in virtuous activities, and with whether such rewards might, under certain conditions, facilitate rather than undermine internalisation.

Watts *et al*. (2021) speculate that rewards might be useful with children who initially require extra encouragement: "Pupils may behave in certain ways because of the initial promise of a reward, but through the process may come to realise … the internal satisfaction of doing good and develop a habit of this behaviour" (p. 79). I henceforth refer to this proposition as the "lure hypothesis." Watts *et al*. (2021) are not the first to make such a suggestion: it is a recurring proposition across education (Benninga, 2020; Theodotou, 2014), philosophy (Peters, 1966, 1965), and psychology (Kohlberg, 1981; Piaget, 1932; Woodworth, 1918) – and has been present in SDT from the beginning (Lepper *et al*., 1973). Perhaps the clearest formulation comes from Ryan and Deci (2000a) themselves: "A person might originally get exposed to an activity because of an external regulation (e.g., a reward), and … such exposure might allow the person to experience the activity's intrinsically interesting properties, resulting in an orientation shift" (p. 63).

It is notable that the lure hypothesis has not been empirically evaluated (Watts *et al*., 2022). This lacuna could be due to the normative qualms of social scientists. It is one thing to show that rewards can undermine intrinsic motivation for an activity that is already intrinsically motivated, quite another to investigate how one might initiate intrinsic motivation for an unmotivated activity. Which activity would the experimenters choose? Is there a class of activities that should be intrinsically motivated? These are normative questions, which tend to make social scientists uneasy. Within the framework of Aristotelian character education, however, there *is* such a class of activities: those that instantiate virtues such as kindness, bravery, and gratitude (Kristjánsson, 2015).

Questions about whether externally initiated engagement can foster internal commitment have been explored in adjacent literatures, particularly in research on mandatory service learning and civic engagement (e.g., McLellan and Youniss, 2003; Stukas *et al*., 1999). This work suggests that externally required participation does not inevitably undermine moral or civic motivation, and may support internalisation under certain conditions. However, such studies typically focus on obligation-based participation and outcomes such as civic identity, rather than on motivational orientation as conceptualised within SDT. The present study extends this line of inquiry by examining whether *reward-initiated* engagement in virtue-relevant activities can support shifts toward more autonomous motivation in early adolescents.

Although there is no direct empirical evidence, the lure hypothesis is theoretically plausible within SDT. If extrinsic rewards can prompt an *outward* motivational shift in those who are initially intrinsically motivated, as per the undermining effect (Ryan and Deci, 2017), then it is plausible that engaging in an internally satisfying activity could prompt an *inward* motivational shift in those who are initially extrinsically motivated (Ryan and Deci, 2000a). Here, "internally satisfying" is understood in SDT terms as engagement in an activity that directly supports basic psychological needs for autonomy, competence, and relatedness, rather than merely producing hedonic pleasure or external benefits.

Importantly, while this mechanism could in principle apply to many behaviours, it is especially relevant to the development of virtue. Virtuous behaviours are not merely instrumental skills but dispositional patterns that are normatively valued and closely tied to affective experience and identity (Morgan *et al*., 2017). SDT research suggests that some activities are more likely than others to satisfy basic psychological needs for autonomy, competence, and relatedness, thereby supporting internalisation rather than mere compliance (Ryan and Deci, 2017). Virtuous practices, understood as activities oriented toward the good

of others or the self in a non-instrumental way, appear to fall into this category (Arvanitis and Stichter, 2023; Curren and Ryan, 2020).

On this view, extrinsic rewards may function as a developmental catalyst: by prompting initial engagement in a virtuous activity, they allow children who would otherwise not participate to encounter intrinsic satisfactions that may not be immediately apparent prior to engagement. As Lepper *et al*. (1973) noted, such effects are most likely when initial interest is low or when an activity's attractiveness "becomes apparent only through engaging in it for a long time" (p. 136). Repeated engagement is thought to support the emergence of autonomous motivation and, in turn, habit formation (Watts *et al*., 2021). The lure hypothesis thus does not claim that rewards create virtue directly, but that they may facilitate the early stages of internalisation for activities that are themselves intrinsically meaningful but not yet intrinsically motivating for all individuals.

The present pilot study explored how the lure hypothesis could be evaluated in the classroom. Students aged 11–12 were *lured* via rewards to engage in journaling activities over six weeks. This age group was chosen because the lure hypothesis is expected to be particularly applicable to younger pupils (Watts *et al*., 2021). This expectation has a long pedigree in philosophical discussions of moral education. Peters (1981, 1965), for example, argued that children often must first be initiated into worthwhile practices before they are capable of appreciating their reasons or intrinsic value, raising the question of whether early engagement sometimes requires external motivators.

Gratitude journaling was selected as the intervention activity as a concrete instantiation of a virtuous practice, given prior evidence that gratitude exercises reliably satisfy basic psychological needs and are associated with enhanced intrinsic motivation (Kashdan *et al*., 2009; Tian *et al*., 2016). Generic journaling, by contrast, was intentionally content-neutral and served to control for time-on task and reflective writing (Froh *et al*.,

2014). While gratitude journaling does not exhaustively express the virtue of gratitude, it engages core affective and reflective components of the virtue (Hebbink *et al*., 2025) and is more virtue-relevant than the content-neutral control activity. On this assumption, the lure hypothesis predicts that the former should produce a greater increase in intrinsic motivation.

It is important to clarify the role of extrinsic rewards in the present design. Despite appearances, the lure hypothesis is not primarily a claim about the effects of rewards themselves. It is trivially true that rewards can increase initial engagement in desired behaviours. Rather, the hypothesis concerns what may occur *after* engagement has been initiated via extrinsic incentives – specifically, whether participation in certain kinds of activities, namely virtuous or value-laden practices, can prompt an inward shift toward more autonomous forms of motivation (Watts *et al*., 2021). Accordingly, rewards were held constant across conditions in the present study, and the critical contrast concerned the nature of the activity (gratitude journaling versus content-neutral journaling). On this formulation, the lure hypothesis predicts a Group × Time interaction, reflecting greater increases in intrinsic motivation for the virtue-relevant activity.

Method

Participants

Sixty-one Year 7 pupils (ages 11–12) from a co-educational, state-funded, inner-city comprehensive school in England were recruited to participate in weekly journaling activities over six weeks. The school serves a socioeconomically diverse urban community, including a substantial proportion of pupils from lower socioeconomic backgrounds. Data were collected between March and April 2025. Pupils were allocated to gratitude journaling (intervention group) or generic journaling (control group). Participants were included in the analysis if they attended at least five journaling sessions, completed all motivation measures with minimal

missing data, and provided assent for data use. Twenty-two pupils satisfied these inclusion criteria: 10 in the intervention group (5 girls, 5 boys), 12 in the control group (8 girls, 4 boys).

Design

The study employed a mixed factorial design with one between-subjects factor (Group: *Intervention* vs. *Control*) and one within-subjects factor (Time: *Pre*, *Post*, and three-week *Follow-up*). Intrinsic motivation was assessed using an adapted Intrinsic Motivation Inventory. The design allowed tests of main effects for Group and Time and their interaction, with the lure hypothesis predicting a significant Group × Time interaction.

Intervention

At each session, participants received a worksheet with five blank lines. The intervention group was prompted to "write down five things in your life that you are grateful or thankful for" (Froh *et al*., 2008). The control group was asked to "write down five things that you have done" (Froh *et al*., 2014). To encourage engagement, participants were also asked to write down *why* they had listed each item. Activity sheets are provided in the online supplementary materials (available at: https://mrbrownpod.com/can-extrinsic-rewards-induce-intrinsic-motivation-for-virtuous-behaviour-a-classroom-based-pilot-study/).

The journaling activities were administered at lunchtime on Tuesdays in adjacent classrooms. The author supervised the gratitude group, while a colleague supervised the control group. Facilitators used a standardised script to introduce the activity and offered no feedback on journal content. Journal content was not reviewed or coded, as entries were treated as private reflections. The intervention lasted for six weeks.

Procedure

Participants were recruited from Year 7 tutor groups in morning tutor periods. Tutors were provided with a register and instructed to record the names of pupils who expressed interest in a lunchtime journaling activity. The activity was described as an opportunity to

reflect on things students had recently done or felt grateful for, without initial mention of rewards. Seventeen pupils volunteered at this stage: they were considered to be intrinsically motivated and therefore excluded from the study.

Pupils were then informed that participation would earn 20 reward points per session (120 points for full participation). Pupils were told that reward points would be awarded only upon completion of all six sessions; in practice, those attending at least five sessions received the reward. An additional 61 pupils (29 girls, 32 boys) volunteered, forming the initial sample. Pupils were allocated by tutor group (to minimise tutor-related variation) to gratitude journaling (n = 31) or generic journaling (n = 30). The recruitment script is provided in the online supplementary materials (available at: https://mrbrownpod.com/can-extrinsic-rewards-induce-intrinsic-motivation-for-virtuous-behaviour-a-classroom-based-pilot-study/).

During the six-week intervention period, tutors were reminded weekly to notify pupils of upcoming journaling sessions. Baseline data collection was initially scheduled after the first session but was postponed to the following week due to a logistical issue affecting attendance. Post-intervention data were collected immediately after the sixth session; reward points were distributed the following day. Follow-up data were collected three weeks later during morning tutor periods.

Measures

Participants' intrinsic motivation was assessed using an adapted version of the Intrinsic Motivation Inventory (IMI; Ryan, 1982) – a widely used multidimensional instrument for measuring intrinsic motivation and self-regulation (Self-Determination Theory, n.d.). The 25-item version employed here, originally validated by Deci *et al*. (1994) in research on internalisation, includes three subscales: *Interest/Enjoyment* (e.g., "This activity was fun to do") provides the most direct self-report index of intrinsic motivation; *Perceived Choice* (e.g., "I did this activity because I wanted to") reflects the extent to which participants

feel autonomous in their behaviour and predicts both self-report and behavioural indicators of intrinsic motivation; and *Value/Usefulness* (e.g., "I think this is an important activity") is associated with internalisation. In line with SDT, "internal satisfaction" is operationalised here in terms of autonomous engagement and internalisation rather than hedonic pleasure alone, constructs directly indexed by these subscales. Responses were rated on a seven-point Likert scale (1 = "not at all true" to 7 = "very true"), with several items reverse-scored. The IMI demonstrates good reliability and construct validity (McAuley *et al*., 1989). Internal consistency (Cronbach's α) for each IMI subscale at each time point was examined in the present sample and is reported in the Results section. Minor wording and formatting adaptations were made to improve readability for 11–12-year-olds. The adapted IMI is provided in the online supplementary materials (available at: https://mrbrownpod.com/can-extrinsic-rewards-induce-intrinsic-motivation-for-virtuous-behaviour-a-classroom-based-pilot-study/).

It is important to note that behavioural motivation (i.e., whether pupils volunteered before or after the introduction of rewards) functioned as a screening criterion rather than an analytic variable. Pupils who volunteered prior to the reward announcement were identified as behaviourally intrinsically motivated and were therefore excluded from participation. Only those who volunteered after the reward announcement – demonstrating behavioural extrinsic motivation – completed the IMI. Consequently, all participants in the analytic sample were extrinsically motivated at baseline. The IMI was thus used to assess relative changes in motivation over time, rather than to classify participants by initial motivational type. Although some participants reported moderate intrinsic motivation on the baseline IMI, this does not undermine the behavioural classification, as self-reported motivation may reflect emerging interest or social desirability rather than autonomous regulation at the point of

recruitment. The baseline IMI therefore served as a reference point for within-person change rather than as a criterion for participant inclusion.

Ethics

There were three main ethical considerations. First, while ethical guidelines emphasise the importance of *informed* consent (British Psychological Society, 2021), disclosing the study's aims at the outset could have influenced pupils' motivation and compromised internal validity. Accordingly, a deferred consent procedure was employed. The headteacher provided informed consent on behalf of the school after receiving a full briefing on the study. Pupils and parents were informed about the journaling activities as part of an optional enrichment programme. Following the final data collection, participants were debriefed on the study's aims and invited to sign age-appropriate assent forms. A follow-up letter was sent to parents, explaining the study and offering a two-week window to withdraw their child's data.

Second, although ethical guidelines stress the importance of *voluntary* consent, the present study necessarily involved extrinsic rewards, which could have led some participants to feel coerced. To mitigate this risk, pupils were informed that participation in the journaling activities was optional and that withdrawal would result only in forfeiting unearned rewards. They were also reminded that reward points could be earned through other school activities. These reassurances were communicated during recruitment and reiterated throughout the intervention period.

Third, intrinsically motivated pupils were excluded from participation to protect not only the study's integrity from potential ceiling effects but also their own motivation from possible undermining effects. However, exclusion itself could impact motivation through perceived unfairness (Gubler *et al*., 2016). To mitigate this risk, these pupils were informed that the activity was oversubscribed and assured they would have the same opportunity the

following term. Their interest was acknowledged and positively redirected by inviting them to take on character leadership roles, contributing to the design of school-wide gratitude activities. This approach was intended to preserve intrinsic motivation by supporting autonomy, competence, and relatedness (Ryan and Deci, 2017).

Analytic Approach

Data for each IMI subscale were analysed using a 3 (Time: *Pre*, *Post*, *Follow-up*) × 2 (Group: *Intervention* vs. *Control*) mixed factorial ANOVA. Internal consistency was assessed for each subscale using Cronbach's α. Assumptions of *normality* (skewness, kurtosis, Shapiro-Wilk test), *sphericity* (Mauchly's test), and *homogeneity of variance* (Levene's test) were checked. All analyses were conducted in *Jamovi* (Version 2.6.26) with an alpha level of .05. Partial eta squared (η^2_p) was reported alongside *p*-values to aid interpretation. Significant effects were followed with Bonferroni-adjusted comparisons.

Missing data were handled conservatively. If at least 80% of items on a subscale at a given time point were completed and internally consistent, the participant's mean score for completed items was used to impute missing values; otherwise, the subscale score for that time point was excluded. In practice, imputation was used for only six item responses, and only one subscale score was excluded due to internal inconsistency.

Participant retention across sessions and potential attrition bias were examined prior to the main analyses.

A *G**Power sensitivity analysis indicated that, given the final sample of 22 participants, the study had 80% power ($\alpha = .05$) to detect a medium-sized Group × Time interaction effect of $f \geq 0.28$ in the mixed factorial ANOVA (Cohen, 2013). Smaller effects would likely have gone undetected. As this was an exploratory pilot, the analysis was intended primarily to estimate the magnitude of effects that future, larger-scale studies should aim to detect.

Results

Attrition Analysis

Of the 61 pupils who initially expressed interest after the introduction of rewards, 33 attended the first journaling session, 31 completed the first IMI, 25 completed the post-intervention IMI, 23 completed the follow-up IMI three weeks later, and 22 provided assent for data usage, forming the final analytic sample. Attrition was primarily due to competing lunchtime commitments (e.g., sports clubs or detentions) and occasional absences.

Baseline IMI scores were compared between completers (n = 22) and dropouts (n = 9). Welch's *t*-tests showed no clear evidence of systematic differences across the three IMI subscales (*Interest/Enjoyment*, *Value/Usefulness*, and *Perceived Choice*), and effect sizes (Hedges' $g \leq 0.35$) suggested that any baseline psychological differences between completers and dropouts were minor, mitigating concerns that attrition biased subsequent analyses.

Preliminary Analyses

Internal consistency (Cronbach's α) for each IMI subscale at each time point is reported in Table I. Reliability was acceptable to good for all subscales at *Pre* and *Post*. At *Follow-up*, internal consistency for the *Perceived Choice* subscale fell below the conventional .70 threshold ($\alpha = .609$; Nunnally, 1978); results involving this subscale at this time point should therefore be interpreted with caution.

Table I

Cronbach's α for each IMI Subscale at each Time point

IMI Subscale	Time point		
	Pre	*Post*	*Follow-up*
Interest/Enjoyment	0.826	0.924	0.931
Value/Usefulness	0.834	0.770	0.782
Perceived Choice	0.793	0.779	0.609

Source: Author's own work

Descriptive statistics are presented in Table II. Distributions were approximately normal with modest variation and no substantial skew/kurtosis. Shapiro-Wilk tests revealed no substantial departures from normality for most variables; however, *Perceived Choice* scores in the intervention group at *Pre* and *Post* were significantly non-normal (p = .028 and .013, respectively). Mauchly's test confirmed sphericity for all subscales. Levene's test supported homogeneity of variance across groups, except for *Perceived Choice* at *Post*, $F(1, 19) = 10.79$, p = .004. Given ANOVA's robustness to modest assumption violations (Blanca *et al*., 2017), all data were retained for analysis.

Table II

Descriptive statistics for IMI subscales by Group and Time point (M, SD)

IMI Subscale	Group	Time point		
		Pre	*Post*	*Follow-up*
Interest/Enjoyment	Intervention	4.62, 1.09	5.27, 1.44	4.63, 1.38
	Control	4.99, 1.27	5.14, 1.03	5.24, 1.01
Value/Usefulness	Intervention	4.94, 1.24	5.21, 0.978	4.95, 0.718
	Control	5.18, 0.991	5.43, 0.886	5.49, 0.838
Perceived Choice	Intervention	5.46, 1.08	5.86, 1.34	5.88, 1.01
	Control	5.33, 1.09	5.98, 0.648	5.54, 0.726

Source: Author's own work

Inferential Analyses

For *Interest/Enjoyment*, there was no significant Group × Time interaction, $F(2, 40) = 1.52$, $p = .231$, $\eta^2_p = .071$, and no significant main effect of Group, $F(1, 20) = 0.398$, $p = .535$, $\eta^2_p = .020$, or Time, $F(2, 40) = 1.73$, $p = .191$, $\eta^2_p = .079$.

For *Value/Usefulness*, there was also no significant Group × Time interaction, $F(2, 40) = 0.598$, $p = .555$, $\eta^2_p = .029$, and no significant main effect of Group, $F(1, 20) = 0.853$, $p = .367$, $\eta^2_p = .041$, or Time, $F(2, 40) = 1.23$, $p = .303$, $\eta^2_p = .058$.

For *Perceived Choice*, there was no significant Group × Time interaction, $F(2, 38) = 0.750$, $p = .479$, $\eta^2_p = .038$, and no significant main effect of Group, $F(1, 19) = 0.121$, $p = .732$, $\eta^2_p = .006$. However, there was a significant main effect of Time, $F(2, 38) = 3.47$, $p = .041$, $\eta^2_p = .154$. Bonferroni-adjusted pairwise comparisons indicated a significant increase in *Perceived Choice* from *Pre* ($M = 5.43$, $SE = 0.243$) to *Post* ($M = 5.92$, $SE = 0.22$), $p = .027$; other comparisons (*Pre* vs. *Follow-up*, *Post* vs. *Follow-up*) were not significant.

Summary of Findings

A summary of inferential results is presented in Table III.

Table III

Summary of inferential statistics for IMI subscales

IMI subscale	Effect	F(df)	p	η^2_p	Significant?
Interest/Enjoyment	Group × Time	$F(2, 40) = 1.52$	.231	.071	×
	Group	$F(1, 20) = 0.40$	.535	.020	×
	Time	$F(2, 40) = 1.73$	.191	.079	×
Value/Usefulness	Group × Time	$F(2, 40) = 0.60$	.555	.029	×
	Group	$F(1, 20) = 0.85$	.367	.041	×
	Time	$F(2, 40) = 1.23$	.303	.058	×
Perceived Choice	Group × Time	$F(2, 38) = 0.75$	.479	.038	×
	Group	$F(1, 19) = 0.12$	.732	.006	×
	Time	$F(2, 38) = 3.47$	.041	.154	✓

Source: Author's own work

Discussion

The lure hypothesis proposes that engaging in internally satisfying, virtuous behaviour can prompt an inward motivational shift in children who are initially extrinsically motivated through rewards (Watts *et al*., 2021). The present pilot study examined this hypothesis in a classroom context. A significant Group × Time interaction was predicted, but none emerged. The absence of an interaction does not necessarily mean that the lure hypothesis is false. It could mean that the difference between the intervention and control activities was not salient enough, or simply that the study lacked sufficient statistical power.

However, one pattern did emerge: there was a significant main effect of Time for *Perceived Choice* from *Pre* to *Post*: despite being initially motivated by rewards, participants in both groups reported feeling more autonomous with respect to the journaling activities. Although this increase was not sustained at *Follow-up*, low internal reliability at that time point makes it difficult to draw any firm conclusions. Nevertheless, the observed increase in perceived autonomy, from *Pre* to *Post*, contrasts with Berkowitz's (2022) claim that extrinsic rewards are "at best ineffective" (p. 592) and aligns with broader formulations of the lure hypothesis – Benninga's (2020) suggestion, for example, that incentives for initially unappealing activities can positively influence later behaviours. Findings tentatively suggest that rewards may help initiate – rather than impede – the early stages of internalisation.

The psychological backdrop to this educational issue is the long-standing tension between behaviourism and SDT. Assuming that gratitude journaling is more internally satisfying than generic journaling (Arvanitis and Stichter, 2023; Tian *et al*., 2016), SDT supports the lure hypothesis in predicting a significant Group × Time interaction. The observed increase in perceived autonomy *across both groups*, however, aligns more closely with a behaviourist interpretation; although the behaviourist would insist that perceived autonomy is only perceived, *not real*, because on this view there is no such thing as self-originating behaviour (Skinner, 1953).

How might this effect be explained? In their aptly titled article, "Illusory Feelings, Elusive Habits" (2021), Mazar and Wood discuss research on consumption habits, including a study showing that individuals with stronger habits reported greater certainty in their intentions (Ji and Wood, 2007). Assuming a close connection between "certainty in intentions" and "perceived autonomy," this could explain the main effect found in the present study: perceptions of autonomy increased as the journaling activities became incorporated into participants' weekly routines. This may also explain why the effect diminished at

Follow-up, once the activities had ended. Notably, this interpretation reverses the causal order suggested by Watts *et al*. (2021): it is not that habit formation follows feelings of autonomy, but rather that feelings of autonomy follow habit formation. This reversal emphasises the importance of early habit formation in character development (Peters, 1981; Vigani, 2024).

Importantly, this effect was observed only for the Perceived Choice subscale. No significant main effects or interactions were found for Interest/Enjoyment or Value/Usefulness. Because Interest/Enjoyment is generally considered the most direct self-report indicator of intrinsic motivation within the Intrinsic Motivation Inventory (IMI; Ryan, 1982), the present findings should not be interpreted as evidence that intrinsic motivation itself increased. Rather, the results suggest that participants came to experience the journaling activity as more autonomous over time without necessarily finding it more enjoyable or more valuable. One possible explanation is that the activity itself remained unchanged across sessions, limiting opportunities for increases in enjoyment; while recognising the value or usefulness of a virtuous practice may require forms of reflection or discussion that were not incorporated into the present intervention. From a SDT perspective, the pattern of results may therefore reflect movement toward more self-endorsed forms of extrinsic motivation (e.g., identified regulation) rather than a shift to intrinsic motivation proper (Ryan and Deci, 2017). For research on the development of virtuous behaviour, this distinction is important: engagement in a practice may become more autonomous through repetition or habit formation without necessarily becoming intrinsically enjoyable.

In sum, the present findings suggest that extrinsic rewards may help initiate internalisation through the formation of habits. For educators designing virtue curricula, this implies that close attention should be paid to the kinds of habits being cultivated – through the application of rewards or other strategies – because once a behaviour becomes habitual, it is more likely to be perceived as autonomous. In this study, participants came to feel more

autonomous with respect to journaling, whether it was virtue-instantiating (gratitude journaling) or morally neutral (generic journaling). The same psychological process could apply, in principle, to harmful behaviours: a child who repeatedly engages in bullying, for example, may come to see it as self-chosen behaviour.

Attention should also be given to the *manner* in which habits are formed. While some habits may arise via the deliberate application of extrinsic motivators such as rewards, this is only the overt tip of a much larger iceberg: most habits are undoubtedly formed through unconscious social assimilation. This underscores the importance of teachers and role models in character education, as well as the broader task of seeking to make the largely unconscious processes of character development more conscious and deliberate (Jubilee Centre for Character and Virtues, 2022).

The absence of a Group × Time interaction also invites further reflection within the framework of Self-Determination Theory. SDT proposes that internalisation is facilitated when activities satisfy basic psychological needs for autonomy, competence, and relatedness (Ryan and Deci, 2017). On this account, gratitude journaling was expected to produce greater increases in autonomous motivation than generic journaling because prior research suggests that gratitude practices reliably support these needs (Kashdan *et al*., 2009; Tian *et al*., 2016). However, the present findings indicate that perceived autonomy increased similarly across both activities. One possibility is that the control activity was not motivationally neutral: reflective journaling itself may support autonomy and competence through opportunities for self-expression. Alternatively, the observed change may reflect a more general process of habit formation, whereby repeated engagement in an activity gradually increases feelings of ownership over that behaviour (Ji and Wood, 2007). In either case, the results suggest that early shifts toward autonomous motivation may occur even when the internal satisfaction of the activity is modest or similar across conditions. Future research should therefore examine

more carefully how different types of activities satisfy psychological needs and how strongly such differences shape the internalisation process in educational contexts.

The present study had several limitations, the most significant relating to sample size and measurement. First, although small samples are not uncommon in exploratory, school-based research (Thomas, 2012), the limited number of participants meant that the study was powered only to detect medium-sized effects ($f \geq 0.28$); smaller effects may have gone undetected. Second, despite being a well-validated instrument (Deci *et al*., 1994), the Intrinsic Motivation Inventory is still a self-report measure and therefore subject to limitations such as social desirability bias, interpretation bias, and limited self-awareness (Paulhus and Vazire, 2007). While some of these general concerns are mitigated with the inclusion of a control group, self-reports of intrinsic motivation in particular typically correlate only modestly (around $r = .4$) with behavioural measures (Self-Determination Theory, n.d.). In addition, the study did not include a formal manipulation check to verify that participants engaged exclusively in the assigned journaling type; overlap between intervention and control activities may therefore have attenuated between-group differences.

Future research could begin by addressing these limitations. The sample size might be increased by recruiting from a larger population or by reducing attrition. Measurement could be strengthened by including a behavioural index, such as time spent engaged in the target activity during a free-choice period (Deci, 1971). Given the current design, the baseline behavioural measure would necessarily be zero for all participants, but such a measure could still be used at later time points to assess emerging autonomy. Future studies might also employ student interviews to explore the subjective experience of “being lured.” Finally, internal validity could be strengthened by incorporating manipulation checks, such as brief content coding of journal entries, or by employing control tasks with a clearer moral contrast to the virtue-relevant intervention.

More broadly, future research should ensure that the intervention and control activities differ meaningfully in their capacity to satisfy basic psychological needs. This might involve pretesting activities for perceived interest, value, or need satisfaction prior to the intervention, or selecting control tasks that are more clearly distinct from the virtue-relevant activity. In addition, the inclusion of a no-intervention comparison group would allow researchers to determine whether changes over time reflect the effects of repeated engagement in the activity itself or more general developmental or contextual influences. Such designs may require more general measures of motivational orientation that do not rely on participation in a specific activity.

A further limitation concerns the identification of participants as initially extrinsically motivated. In the present study, this classification was based on behavioural criteria: pupils who volunteered only after the introduction of reward points were assumed to require an external incentive to engage in the activity. However, baseline IMI scores indicated moderate levels of intrinsic motivation across the sample. This discrepancy highlights a broader challenge in motivation research: behavioural indicators and self-report measures may capture different aspects of motivational orientation. Behavioural engagement following the introduction of rewards suggests that participants required an external incentive to initiate participation, yet self-report responses may have reflected emerging interest, mixed motivational states, or social desirability biases. Consequently, neither indicator can be treated as a definitive measure of motivational orientation on its own. Future research could address this issue by triangulating multiple indicators of motivation, for example, by combining behavioural screening with validated SDT instruments (e.g., the Self-Regulation Questionnaire; Ryan and Connell, 1989) or using baseline IMI scores as part of the inclusion criteria.

The present study was designed to investigate whether an inward motivational shift could be induced through mere engagement in a virtuous activity. The same design could be readily adapted to investigate other internalisation strategies within character education (e.g., Arthur *et al*., 2022; Niemiec and Ryan, 2009). Future research might also explore variations in the administration of rewards – for example, "weaning students off" rewards (Berkowitz, 2021).

One final point: Following ethical research guidelines (e.g., British Psychological Society, 2021), educational studies often recruit only *voluntary* participants. This creates a methodological and ethical challenge for character education, because children who volunteer to engage in virtuous activities are typically already autonomous and, therefore, already on the path to flourishing. It is the initially unmotivated children who stand to gain most from character education, yet they are systematically excluded from much of the research. By encouraging participation through extrinsic rewards, the present study offers a more inclusive – and arguably fairer – way forward.

Conclusion

This paper began by posing a dilemma for character education: denounce rewards and risk alienating many schools (e.g., Berkowitz, 2022), or embrace rewards and risk instrumentalising character (e.g., Tough, 2013). While rewards can undermine intrinsic motivation (Deci *et al*., 1999), this effect applies only to individuals who are already intrinsically motivated (Ryan and Deci, 2000b). This realisation opened up some space within the dilemma: Could rewards serve a purpose for unmotivated children, perhaps *luring* them into developing intrinsic motivation for virtuous behaviour? Despite being a common and theoretically plausible suggestion (e.g., Ryan and Deci, 2000a), there has until now been no empirical evidence for this "lure hypothesis." The present pilot study explored how this gap might be addressed through a classroom-based intervention.

Although no evidence was found for Watts *et al*.'s (2021) specific formulation of the lure hypothesis, a significant main effect of Time did emerge – initially extrinsically motivated students reported an increase in perceived autonomy – offering tentative support for broader formulations of the lure hypothesis (e.g., Benninga, 2020). Perceptions of autonomy may have increased as the activities became habitual (Mazar and Wood, 2021), suggesting that practitioners should pay close attention to the kinds of habits being cultivated through the use of rewards and other strategies.

This was an exploratory study with several notable limitations, and its findings should be interpreted with caution. Nonetheless, it shows that hypotheses such as the lure hypothesis can be tested in the classroom, and that there may yet be a legitimate role for rewards in character education.

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