# Evaluating the Lure Hypothesis:

# Can Extrinsic Rewards Induce Intrinsic Motivation for Virtuous Behaviour?

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**Statement on the Use of Generative Artificial Intelligence**

In line with the University's guidance on the ethical use of Generative AI, I would like to acknowledge that ChatGPT was used during the preparation of this dissertation in the following limited ways:

- To help consolidate guidance from Canvas into a single plan/checklist for each section. This use was approved by my dissertation tutor, Shane McLoughlin, via email.
- To help with minor editorial tasks typically allowed of a third-party proofreader, such as flagging unclear phrasing or suggesting alternatives to improve clarity and grammar. This use aligns with the University's description of a "third-party editorial assistant."

Generative AI was not used to generate content, ideas, or arguments on my behalf, nor to rewrite, restructure, or otherwise alter the intellectual content of this dissertation. All conceptual development, data analysis, interpretation, and academic writing are entirely my own.

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**Abstract**

Character education emphasises the cultivation of intrinsic (i.e., autonomous) motivation. However, extrinsic rewards are ubiquitous in schools and have been shown to undermine intrinsic motivation – though this effect applies only to those who are already intrinsically motivated. Conversely, the present study explored whether extrinsic rewards might help initially unmotivated children develop intrinsic motivation for virtuous behaviours – a proposition known as the *lure hypothesis*.

A six-week classroom-based intervention was conducted with 22 extrinsically motivated students (aged 11–12), assigned to either a gratitude journaling (*Intervention*) or generic journaling (*Control*) group. Intrinsic motivation was measured at three timepoints (*Pre*, *Post*, and *Follow-up*) using an adapted Intrinsic Motivation Inventory (IMI) comprising three subscales: *Interest/Enjoyment*, *Value/Usefulness*, and *Perceived Choice*. Data for each subscale were analysed using a 2 (Group) × 3 (Time) mixed factorial ANOVA. Contrary to predictions, no Group × Time interaction emerged. However, there was a significant main effect of Time for *Perceived Choice*, from *Pre* to *Post*, offering tentative support for more general formulations of the lure hypothesis.

Key limitations included a small sample size, violation of homogeneity of variance for *Perceived Choice* at *Post*, internal inconsistency for *Perceived Choice* at *Follow-up*, and reliance on self-report measures. Despite these limitations, the study offers an initial empirical evaluation of a long-standing theoretical proposition, raising important questions for future research and for the ethical use of reward-based strategies in character education.

*Keywords:* character education, intrinsic motivation, extrinsic rewards, lure hypothesis, self-determination theory

# Evaluating the Lure Hypothesis:

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## Introduction

Aristotle (2004) wrote that an act is virtuous only if it is chosen for its *own* sake. Accordingly, many modern programmes of character education (Aristotelian and otherwise) place central importance on the cultivation of *intrinsic* motivation (e.g., Berkowitz, 2021; Character.org, 2018; DfE, 2019; Jubilee Centre, 2022).

Yet schools are often awash with extrinsic motivators, especially rewards. This is not inherently problematic. On the contrary, growing up involves learning how to engage in unappealing behaviours as a means to a more appealing end. But it does pose a particular challenge for character education, as extrinsic rewards have been shown to undermine intrinsic motivation (Ryan and Deci, 2017). Naturally, rewarding a child for an intrinsically motivated activity makes them more likely to see the activity merely as a means to earning rewards. Character educationists thus face a dilemma: renounce rewards and risk alienating many schools (e.g., Berkowitz, 2022), or embrace instrumentalism and risk diminishing the whole enterprise (e.g., Tough, 2013).

Others have tried to carve out a third way, suggesting that rewards could be used to help motivate initially unmotivated children – almost as a *lure* (e.g., Watts, Fullard and Peterson, 2021). In fact, this is a recurring proposition across the fields of education, psychology, and philosophy. Surprisingly, however, it is yet to face empirical evaluation. The purpose of the present study was to address this gap through a classroom-based intervention.

## Literature Review

### Recent Debate

The role of rewards in character education, and moral education more broadly, is a matter of debate. Watts, Fullard and Peterson (2021) suggest that rewards might be useful with children who initially require additional encouragement to engage in positive behaviours:

> Pupils may behave in certain ways because of the initial promise of a reward, but through the process may come to realise the importance of the behaviour and the emotional satisfaction associated with this. A pupil who repeatedly volunteers to help because they know they will receive a reward may eventually realise the internal satisfaction of doing good and develop a habit of this behaviour. (p. 79)

Berkowitz (2022) strongly disagrees. He argues that rewards (e.g., stickers, certificates, candy, trinkets) are detrimental to character development, often undermining the internalisation of virtues and distracting from strategies that promote internalisation (viz., positive relationship-building, role modelling, high expectations, and restorative practices). “It is quite challenging” he laments, “to get [educators] to realise that [extrinsic motivators, e.g. rewards] are at best ineffective and at worst counterproductive to flourishing” (p. 592). In response, Watts, Fullard and Peterson (2022) maintain that rewards *can* play a role in facilitating the desired internalisation, suggesting that character education ought to adapt – initially, at least – to accommodate the widespread use of extrinsic motivators in education. They concede, however, that more empirical research is needed.

Despite being seemingly entrenched, neither Watts, Fullard and Peterson (2021, 2022) nor Berkowitz (2022) offer fully developed arguments for their respective positions. The former do not explain why rewards might support internalisation; the latter offers little more than an assertion that rewards undermine it. In this review, I reconstruct these arguments and critically examine them in light of the existing literature – a literature marked by terminological confusion and significant gaps.

**Berkowitz’s Argument**

Berkowitz’s (2022) implicit argument can be explicitly reconstructed from his book, *PRIMED for character education* (2021). In essence,

1. Intrinsic motivation is essential for character development (p. 110);
2. Extrinsic rewards undermine intrinsic motivation (pp. 113–114);

3. Therefore, extrinsic rewards have no place in character education.

The argument appears to be *valid* – that is, the conclusion seems to follow from the premises – at least on the uncontroversial assumption that if *X* undermines something that is essential for character development, then *X* has no place in character education. But for an argument to be *sound*, it is not enough that it is valid; its premises must also be *true*, or at least well supported by evidence. Each premise will be considered in turn.

**Is Intrinsic Motivation Essential for Character Development?**

When discussing intrinsic motivation, it has become almost obligatory to begin with the work of psychologists Richard M. Ryan and Edward L. Deci – the founders of Self-Determination Theory (SDT; Ryan, 2023; Ryan and Deci, 2017). The first of SDT's mini-theories – Cognitive Evaluation Theory (CET) – was originally formulated to account for intrinsic motivation, a phenomenon which did not seem to fit within the prevailing psychological paradigm of behaviourism. I will return to this historical issue in the following sub-section.

Motivation is that which energises and gives direction to behaviour (Ryan and Deci, 2017). Some behaviours are performed for their inherent satisfactions (feelings of interest or enjoyment), in which case the motivation is "intrinsic" – that is, the motivation originates *within* the behaviour itself. Intrinsically motivated behaviours are experienced as *autonomous* or "self-governing." Other behaviours are performed instrumentally as a means to some separable consequence (e.g., to earn a reward or avoid a sanction), in which case the motivation is "extrinsic" – that is, the motivation originates *outside* the behaviour (Ryan and Deci, 2000a, 2000b). For example, if a child draws a picture purely because she enjoys drawing, then she is intrinsically motivated. Otherwise, if she draws a picture as a means to an end – to earn a reward, say – then she is extrinsically motivated.

While intrinsic motivation has been linked to optimal development and psychological wellness (Ryan and Deci, 2017), there is nothing inherently moral or virtuous about intrinsic motivation. One can easily imagine an intrinsically motivated villain – someone who inflicts pain

on others purely for the joy of inflicting pain (a sadist). This means that intrinsic motivation cannot be *sufficient* for good character. But many would argue that is *necessary*.

Within a neo-Aristotelian framework, good character consists in *virtues* (Jubilee Centre, 2022; Kristjánsson, 2017; Watts, Fullard and Peterson, 2021, 2022). There are *moral* virtues (e.g., courage, justice, honesty, compassion, gratitude), which include as a subset the *civic* virtues (e.g., citizenship, volunteering). There are also *intellectual* virtues (e.g., critical thinking, curiosity, *phronesis*) and *performance* virtues (e.g., teamwork, determination, resilience). However, only the moral virtues have *inherent* value. Intellectual and performance virtues, by contrast, derive their value only by serving the moral virtues. In fact, without moral direction, these virtues can even become dangerous (Kristjánsson, 2017). Consider, for example, the sadist's *determination* (a performance virtue) to inflict pain on others.

Virtues can be further analysed into components: perception, emotion, desire, motivation, behaviour, and style (Kristjánsson, 2017). Regarding motivation, Aristotle (2004) wrote that an act is virtuous (in the fullest sense) only if it is chosen for its own sake (p. 37 [1105a30–34]). Thus, the connection between good character and intrinsic motivation begins to emerge. "Intrinsic motivation is salient," Curren (2014) explains, "because it is essential to moral credit or virtue that the agent do what is right or virtuous *because* it is right or virtuous" (p. 487; emphasis in original). For example, if a child helps a teacher hand out books purely because they want to help, this behaviour could qualify as virtuous. Otherwise, if she helps the teacher as a means to an end – to earn a reward, say – then this behaviour would not be virtuous (not in the fullest sense, at least).

One might reasonably object, here, that motivation is but one component of virtue, and that no single component can be morally evaluated in isolation (Kristjánsson, 2017). In response, briefly, I would suggest that the motivation component of virtue seems to subsume the other components and *antecedents* (perception, emotion, desire) or *consequents* (behaviour, style) – it is the glue that binds a virtue together. Evaluating motivation thus seems to

capture much (if not all) of virtue (or vice, as the case may be). Moreover, it is only through the motivation component that we can make sense of what it means for a virtue to be "internalised" – none of the other components accommodate a meaningful internal/external continuum. (I will return to the issue of internalisation shortly.)

Intrinsic motivation thus seems to be *necessary* for good character – that is, an act cannot be virtuous unless it is intrinsically motivated. This is certainly the prevailing view among character educationists: intrinsic motivation features explicitly on the upper trajectory of the Jubilee Centre's (2022) neo-Aristotelian model of moral development; it is the seventh principle in Character.org's (2018) *11 Principles*; in Berkowitz's (2021) *PRIMED* framework, the "I" stands for "intrinsic motivation"; and the Department for Education (2019) includes an emphasis on intrinsic ("internal") motivation in its character education framework guidance. So, if intrinsic motivation is necessary for virtue, and good character consists in virtues, then one might safely conclude that intrinsic motivation is indeed necessary for character development – as per the first premise of Berkowitz's (2021) argument (above).

So far, I have painted a fairly straightforward picture. In truth, it is rather messy. First, it is highly debatable whether intrinsic motivation – defined by SDT as referring to behaviours performed for their inherent satisfactions (Ryan and Deci, 2000a, 2000b) – is necessary for good character. For not all virtuous behaviours are inherently satisfying. On the contrary, some virtues (*temperance* or *moderation*) require us to resist inherently satisfying behaviours or "pleasures." Such abstinence, despite being virtuous, often induces a sense of *frustration* – especially initially, when the "pleasure" is tantalisingly close at hand – and frustration is diametrically opposed to satisfaction. Beyond frustration, some virtuous behaviours might even be experienced as painful, as in the case of *post-phronetic* pain, which can occur after making a difficult moral decision (Kristjánsson and Fowers, 2024). So, if virtuous behaviours can be experienced as frustrating or even painful, then it seems that intrinsic motivation (qua inherently satisfying behaviours) is not necessary for good character, after all. This threatens to

undermine Berkowitz's (2021) argument (above) and raises some serious exegetical questions regarding Aristotle's (2004) claim that an act is not virtuous unless it is chosen for its own sake (p. 37 [1105a30–34]). For if some virtuous behaviours hold no inherent satisfaction, but could instead be experienced as frustrating or even painful, then how can one be expected to choose those behaviours *for their own sake*? (I will return to this exegetical question shortly.)

Surprisingly, however, despite regularly invoking the findings of SDT, few (if any) character educationists stick to SDT's definition of "intrinsic motivation." Consider the following passage from Berkowitz (2021):

> While the I in PRIMED stands for Intrinsic Motivation, it could also stand for internalization. By this I mean the relocation of values from the parents, teachers, school, and community (*outside* the child) to residing *inside* the child. … We want those values to move from being something we know, understand, and see to something we are. That is internalization. (p. 110; emphasis in original)

Within SDT, however, "intrinsic motivation" and "internalisation" are not interchangeable terms. Intrinsic motivation is defined in contradistinction to extrinsic motivation, where behaviours are performed instrumentally for some separable outcome (Ryan and Deci, 2000a, 2000b). But extrinsic motivation is not a homogeneous phenomenon; rather, there are different types. Organismic Integration Theory (OIT) – another one of SDT's mini-theories – distinguishes these types via the concept of *internalisation*, defined as "the process of taking in values, beliefs, or behavioural regulations from external sources and transforming them into one's own" (Ryan and Deci, 2017, p. 180). This process yields four main types of extrinsic motivation, which vary in their relative autonomy: *external regulation* (external rewards/punishments; least autonomous), *introjected regulation* (internal rewards/punishments, e.g. pride or guilt), *identified regulation* (behaviour seen as personally important), and *integrated regulation* (activity coheres with personal values; most autonomous) (see also Pelletier and Rocchi, 2023). Thus, it becomes clear that when Berkowitz (2021) speaks of "intrinsic motivation" (e.g., above), what he in fact

has in mind is a highly internalised or autonomous form of extrinsic motivation – at least to the level of identified regulation, if not fully integrated regulation. The same can be said for his interlocutors, Watts, Fullard and Peterson (2021, p. 79; quoted above).

It is important to stress, however, that intrinsic motivation and internalised regulation are psychologically distinct types of motivation. Intrinsic motivation, for example, is focussed on present experience, whereas internalised regulation is more focused on future goals; accordingly, the former is typically spontaneous, whereas the latter is often the result of conscious reflection or deliberation (Ryan and Deci, 2017). Furthermore, one might engage in inherently satisfying behaviours that one does not personally value or may even deem harmful, as in the case of "guilty pleasures." Conversely, one might engage in personally valuable behaviours that one experiences as frustrating or even painful, as in the case of *post-phronetic* pain (Kristjánsson and Fowers, 2024). In short, intrinsic motivation does not entail internalised regulation, nor does internalised regulation entail intrinsic motivation – the two are psychologically and conceptually distinct.

We have seen, then, that while intrinsic motivation as defined by SDT does not seem to be necessary for virtue, Berkowitz (2021) in fact has another meaning in mind – that of internalised regulation. Using "intrinsic motivation" to refer to internalised regulation is, strictly speaking, a mistake – according to SDT, at least. Ultimately, however, Berkowitz (2021) means to use the term in a way that makes his argument against the use of extrinsic rewards (above) a sound argument – and "internalised regulation" could indeed serve this purpose. For it seems that internalised regulation (unlike intrinsic motivation) *is* necessary for virtue, and thus essential for character development.

At first, the connection between virtue and internalised regulation is perhaps easiest to see via the intellectual meta-virtue of *phronesis* ("practical wisdom"). Aristotle (2004) wrote that one cannot be truly good (i.e., virtuous) without *phronesis*, nor can one possess *phronesis* without being good (p. 166 [1144b30–32]). *Phronesis* involves having a generally justifiable

conception or "blueprint" of the good life, which includes one's ethical aims and aspirations (Kristjánsson and Fowers, 2024). Now, consider the following from Ryan and Deci (2017): "With internalized regulation, … the individual must bring the future into the present so that he or she will not only experience the satisfaction of being self-regulated but also the satisfaction of making progress toward an important future goal" (p. 198). Bringing Aristotle and SDT together, we might claim that one cannot be fully virtuous (in the present) unless one has a sufficiently internalised "blueprint" of the good life (see also Arvanitis and Stichter, 2023; Krettenauer and Curren, 2020; Ryan, Curren and Deci, 2013). That is to say, internalised regulation is necessary for fully developed virtue.

Returning to the exegetical question, shifting focus away from inherently satisfying behaviours helps us make sense of Aristotle's (2004) claim that an act is virtuous only if it is chosen *for its own sake* (p. 37 [1105a30–34]). Indeed, if we consider virtuous actions to be not merely conducive but rather *constitutive* of the good life (Kristjánsson, 2017), then one might reasonably claim that even frustrating or painful behaviours can be chosen *for their own sake* – that is, for the sake of something (i.e., the good life) of which the behaviour is seen as a constituent part. To take a non-moral example, I might choose to clean my bathroom *for its own sake*, not because I find the activity inherently satisfying (far from it), but rather because I personally value having a hygienic home, of which the bathroom is a constituent part. Furthermore, Aristotle's specification that the behaviour be actively "chosen" aligns more closely with internalised regulation, which is usually the result of conscious deliberation; whereas intrinsically motivated behaviours are often performed spontaneously (i.e., without premeditation).

So, on this emerging view, a virtue would be "internalised" as the motivation for its associated behaviours becomes increasingly autonomous. For example, if a child is kind initially only on the promise of rewards, but in time comes to personally value kindness for its own sake (perhaps via some reflective process), then this shift in motivation – from external to

identified if not fully integrated regulation – would constitute an internalisation of compassion, and thereby a development in character (Brown, 2023b). Corroborating this view, there appears to be a strikingly direct correspondence between OIT's four types of increasingly internalised/autonomous extrinsic motivation and Sanderse's (2015) "stages" of Aristotelian moral development, namely: "morally indifferent" (external regulation), "un-self-controlled" (introjected regulation), "self-controlled" (identified regulation), and "properly virtuous" (integrated regulation; see also Curzer, 2012).

In sum, it is internalised regulation, not intrinsic motivation, that is necessary for virtue, and thus essential for character development. However, while important theoretically, the distinction between intrinsic motivation and internalised regulation is of little *practical* significance. For the purposes of predicting behaviours, what functionally matters most is that both forms of motivation are experienced as highly *autonomous* (Ryan and Deci, 2017). Any external factors that undermine autonomy would therefore have a functionally equivalent effect on both intrinsic motivation and internalised regulation. Thus, in what follows, in keeping with other character educationists (e.g., Berkowitz, 2021), I will also use the term "intrinsic motivation" in a more general sense to refer to highly autonomous forms of motivation – that is, forms of motivation that are not only essential for character development, but are also seemingly undermined by the use of extrinsic rewards.

**Do Extrinsic Rewards Undermine Intrinsic Motivation?**

As noted above, SDT arose to account for intrinsic motivation, a phenomenon which did not seem to fit within the prevailing psychological paradigm of behaviourism. According to operant psychology – an advanced form of behaviourism developed by B. F. Skinner (1953) – all voluntary behaviours are under the control of external reinforcement contingencies. On this view, the concept of "intrinsic motivation" just refers to baseline ("operant") behaviours for which the reinforcement contingencies are yet to be identified (Carton, 1996; Flora, 1990). This view implies that intrinsic and extrinsic motivations are *additive*, as Ryan and Deci (2017)

explain: “Total motivation would increase when salient extrinsic rewards were introduced and would return to prereward baseline [i.e., “intrinsic motivation”] after the reward was removed” (p. 125). This has been a major point of contention between operant psychology and SDT.

To test whether intrinsic and extrinsic motivation were additive, Deci (1971) created two groups working on interesting puzzles. One group received rewards for each puzzle solved; the other group worked without rewards. Participants were then left alone with the puzzles, among other interesting activities. Findings revealed that the reward group showed a *decrease* in their subsequent intrinsic motivation compared to the control group. In other words, following the introduction and withdrawal of reinforcement, instead of returning to baseline as operant psychology predicts, the amount of responding in fact went *below* baseline (Ryan and Deci, 2017).

These undermining effects were soon replicated (Deci, 1972b, 1972a). Despite some spirited defence from behaviourists (e.g., Calder and Staw, 1975; Scott, 1976), other researchers began to replicate the findings under different conditions (e.g., Ross, 1975), including school-based contexts (Lepper, Greene and Nisbett, 1973; see also Deci, Koestner and Ryan, 2001). Two decades and over a hundred experiments later, Deci, Koestner and Ryan’s (1999) meta-analysis confirmed that extrinsic rewards (viz., tangible, task-contingent rewards) do reliably undermine intrinsic motivation (cf. Eisenberger, Pierce and Cameron, 1999). For present purposes, it is worth noting that the undermining effect has also been replicated within the context of moral (“prosocial”) behaviours: Warneken and Tomasello (2008) found that rewards undermine very young children’s intrinsic motivation for helping others.[1]

The undermining effect of rewards is usually explained in terms of a shift in *perceived locus of causality* (PLOC; de Charms, 1968; Heider, 1958). Behaviours can be experienced (“perceived”) as originating within the self, in which case the PLOC is *internal*, or as originating

[1] For more recent challenges from behaviourists, see Reiss (2012) and Catania (2013). For recent discussion on the effects of immediate versus delayed rewards on intrinsic motivation, see Goswami and Urminsky (2017) and Woolley and Fishbach (2018).

outside the self, in which case the PLOC is *external*. Accordingly, autonomously motivated behaviours have an internal PLOC, whereas extrinsically motivated behaviours often have an external PLOC.[2] The problem with extrinsic rewards is that they can prompt a shift in PLOC from internal to external, as Ryan and Deci (2017) explain: "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). In other words, rewards often undermine autonomy, and thereby diminish intrinsic motivation. (Rewards would therefore have a functionally equivalent effect on internalised regulation; see Bartholomew, Ntoumanis and Thøgersen-Ntoumani, 2009.)

It all seems to be falling into place for Berkowitz's (2021) argument. Not only is intrinsic (qua autonomous) motivation essential for character development, as established in the previous sub-section, but there is also a huge body of evidence supporting his claim that extrinsic rewards undermine intrinsic motivation. We might be forced to accept his conclusion, after all: extrinsic rewards have no place in character education.

**Shifting Meanings**

The premises of Berkowitz's (2021) argument are well supported by evidence. But, despite first impressions, the argument is not in fact valid – that is, the conclusion does not follow from the premises. In particular, Berkowitz (2021) unwittingly commits the fallacy of *equivocation*: the meaning (or implied meaning) of the term "character education" changes throughout his argument.

Starting with the second premise, while SDT – specifically, Cognitive Evaluation Theory (CET) – may have shown that rewards undermine intrinsic motivation, these findings only apply to behaviours that start off intrinsically motivated. As Ryan and Deci (2000b) explain:

[2] Specifically, intrinsic motivation, integrated regulation, and identified regulation all have an internal PLOC; whereas introjected regulation and external regulation have an external PLOC (Ryan and Deci, 2017).

> It is critical to remember, however, that people will be intrinsically motivated only for activities that hold intrinsic interest for them, activities that have the appeal of novelty, challenge, or aesthetic value. For activities that do not hold such appeal, the principles of CET do not apply, because the activities will not be experienced as intrinsically motivated to begin with. (p. 71)

For example, in Warneken and Tomasello's (2008) study, 18 children – 33% of the original sample – were excluded during the treatment phase because they demonstrated no intrinsic motivation for helping. Thus, by invoking CET's findings in his second premise, Berkowitz (2021) implies that character education is only for those who are already intrinsically motivated. If character education was rightly reserved for such a privileged few, then extrinsic rewards would indeed have no place within character education. But, also, there would be little (if any) need for character education, as those who are intrinsically motivated to engage in virtuous behaviours already have good character! From this perspective, Berkowitz's (2021) argument not only appears elitist, but also diminishes character education to the point of redundancy (Brown, 2023a).

Turning to the first premise, however, it is clear that Berkowitz (2021) does not think that character education is only for those who are already intrinsically motivated. Recall that he equates "intrinsic motivation" with "internalisation" – a process which involves taking in values from external sources and transforming them into one's own. Those who are intrinsically motivated have already undergone this transformation – or, if they were raised by moral exemplars, they may have never needed to undergo such a process, as values may have been ingrained in them from the very start. But it is clear that Berkowitz (2021) does not only have such a privileged few in mind. He is concerned (perhaps chiefly concerned) with those who are not intrinsically motivated and yet to begin internalising values. And rightly so! For it is these less privileged individuals, those who may have been raised in suboptimal moral conditions, who stand to gain the most from character education.

Thus, the meaning of "character education" has shifted from one premise to the other: the second premise implies that character education is only for those who are already intrinsically motivated, whereas unpacking the first premise reveals that character education rightly includes those who are not yet intrinsically motivated. Berkowitz's (2021) argument is therefore invalid. In sum, extrinsic rewards may undermine intrinsic motivation in those who are already intrinsically motivated – but this does not necessarily mean that rewards cannot play a positive role for those who are not yet intrinsically motivated.

**The Alluring Lure Hypothesis**

The big hole in Berkowitz's (2021) argument reflects a big gap in the literature, which has proven fertile ground for speculation. Watts, Fullard and Peterson (2021) operate within this gap when they suggest that rewards could help initiate intrinsic motivation (p. 79; quoted above). I will henceforth refer to this proposition as the "lure hypothesis" – the idea being that rewards might be used to *lure* children into virtuous behaviours, which could kickstart the process of internalisation and culminate in more autonomous forms of motivation (identified or integrated regulation, if not intrinsic motivation proper). Watts, Fullard and Peterson (2021) are not the first to suggest a lure hypothesis. On the contrary, it is a recurring proposition across the fields of philosophy, psychology, and education, as I will now briefly illustrate.

In "Education as initiation" (1965), philosopher R. S. Peters writes: "One technique of initiation is … to lure people inside the citadel by using their existing interests in the hope that, once inside, they will develop other interests which previously were never dreamed of" (p. 73; see also Peters, 1966, p. 62). If "existing interests" are taken to include interest in extrinsic rewards, then this passage is a clear affirmation of the lure hypothesis. More broadly in moral development, the lure hypothesis is implied by any theory that grants a role for extrinsic rewards at lower levels of development while nevertheless aiming for autonomy at higher levels of development – theories such as those of Piaget (1932), Kohlberg (1981), and the Jubilee Centre (2022). On this note, it is also worth observing that the lure hypothesis implies a solution to

Peters' (1981) famous "paradox of moral education" – that is, an answer to the question of how one can be trained heteronomously to become autonomous (Kristjánsson and Fowers, 2024)? In short, the solution is to lure children into engaging in inherently valuable behaviours via the promise of rewards.

In 1918, psychologist R. S. Woodworth wrote:

> … while a man may enter a certain line of business from a purely external economic motive, he develops an interest in the business for its own sake … The end furnishes the motive force for the search for means, but once the means are found, they are apt to become interesting on their own account. (p. 104)

In other words, extrinsic motivation might eventually lead to intrinsic motivation for certain behaviours, as per the lure hypothesis. Moreover, the same idea has been present in SDT from the very beginning, usually by way of caveat. In the penultimate paragraph of their seminal article, Lepper, Greene and Nisbett (1973) write:

> … the proposition that extrinsic incentives may often be used effectively to increase interest in a certain broad class of activities … should be particularly true when (*a*) the level of initial intrinsic interest in the activity is very low and some extrinsic device is essential for producing involvement with the activity; or (*b*) the activity is one whose attractiveness becomes apparent only through engaging in it for a long time or only after some minimal level of mastery has been attained. (p. 136)

Echoing this, Ryan and Deci (2000a) write: "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). Warneken and Tomasello (2008) also acknowledge the possibility that "material rewards might have positive effects when children's inclination to help is, for some reason, very low" (p. 1787).

In education, beyond Watts, Fullard and Peterson (2021), Theodotou (2014) suggests that extrinsic rewards might have a positive impact on intrinsic motivation in some situations. And, drawing on insights from Piaget and Kohlberg, Benninga (2020) writes: "Educators and parents intuitively know that offering incentives to children to engage in activities that may not initially appeal to them is often effective in getting them involved and can positively influence subsequent behaviors" (para. 5). On the more practical side, the lure hypothesis is likely to be the driving intuition behind the widespread use of extrinsic rewards in schools and other educational settings. For example, whenever an educator speaks of "weaning students off" rewards (Berkowitz, 2021), or something to that effect, one might safely infer that they have some version of the lure hypothesis in mind.

Thus, across multiple fields of research and in the practical sphere, the lure hypothesis seems ever-present. It is remarkable, then, that there is no empirical evidence to support it! Why haven't the Self-Determination Theorists, in particular, tested the idea that intrinsic motivation might be initiated via extrinsic rewards? One plausible explanation is that psychologists are wary of committing the naturalistic fallacy. It is one thing to show that extrinsic rewards can undermined intrinsic motivation for an activity that is already intrinsically motivated, quite another to investigate whether one might induce intrinsic motivation via rewards for an initially unmotivated activity. Which activity would the experimenters choose? Is there a class of activities which should, ideally, be intrinsically motivated? This is an inherently normative question, and such questions tend to make psychologists uneasy.

As Kristjánsson (2013) explains, however, many social scientists fail to distinguish between the normative as *evaluative* and the normative as *prescriptive*. Here, for example, one might determine that a certain class of activities should be intrinsically motivated – or at least that some activities are better candidates for intrinsic motivation than others – without necessarily prescribing those activities. And, within a neo-Aristotelian framework, there *is* such

a class of activities – namely, activities that instantiate inherently valuable moral virtues, such as courage, honesty, compassion, and gratitude (Kristjánsson, 2017).

It is also worth pointing out that no evidence for the lure hypothesis could possibly be forthcoming from the behaviourist quarter. Recall that, according to behaviourism, all voluntary behaviours are controlled by external reinforcement contingencies; there is no such thing as intrinsic (i.e., autonomous) motivation (Skinner, 1971). Thus, from a behaviourist perspective, the lure hypothesis – that extrinsic rewards might be used to initiate intrinsic motivation – simply makes no sense.

However, while there may be no empirical evidence, the lure hypothesis is theoretically plausible within the SDT framework. Ryan and Deci (2017), recall, explain the undermining effects of extrinsic rewards in terms of a shift in PLOC from internal to external. However, if extrinsic rewards can prompt an *outward* shift in PLOC in those who are already intrinsically motivated (Ryan and Deci, 2017), then it makes sense to suppose that engaging in an inherently valuable activity – specifically, a morally virtuous activity – might prompt an *inward* shift in PLOC in those who are initially extrinsically motivated (Brown, 2023a, 2023c). From this perspective, the lure hypothesis appears to essentially assert the contrapositive of the well-documented undermining effect of extrinsic rewards.

Note that this formulation of the lure hypothesis operates on the assumption that some behaviours are indeed inherently valuable or "internally satisfying" (Watts, Fullard and Peterson, 2021). This assumption is justifiable via existing SDT research, which has shown that some behaviours are more likely to satisfy our intrinsic tendencies to grow and live well (for discussion, see Arvanitis, 2024). These behaviours include prosocial behaviours such as empathy, helping, and – most importantly for present purposes – gratitude (e.g., Tian *et al.*, 2016).

### Summary and Research Question

As per the first premise of Berkowitz's (2021) argument (above), intrinsic (i.e., autonomous) motivation is indeed essential for character development. However, while extrinsic rewards have been shown to undermine intrinsic motivation in those who are already intrinsically motivated (Ryan and Deci, 2017), this does not necessarily imply that rewards cannot play a positive role for those who are initially unmotivated. There is a considerable gap in the literature, here, which has led some – indeed, *many* – to speculate that extrinsic rewards might help initiate the development of intrinsic motivation (e.g., Watts, Fullard and Peterson, 2021). While there is currently no empirical evidence for this "lure hypothesis," perhaps due to the normative skittishness of social scientists, the proposition is theoretically plausible. For if extrinsic rewards can prompt an outward shift in motivation, then presumably an inherently valuable activity could prompt an inward shift in motivation.

The research question that this study aims to address is as follows: Is the lure hypothesis true? That is, can rewards be used to help initially unmotivated children develop autonomous motivation for virtuous behaviours?

## Method

### Design

First, a note regarding rationale: Despite appearances, the lure hypothesis is not primarily a claim about the effects of extrinsic rewards. It is trivially true that rewards can encourage engagement in desired behaviours. Rather, the hypothesis concerns the effect that a certain class of behaviours – specifically, virtuous behaviours – might have on those who are initially extrinsically motivated. The suggestion is that such behaviours, due to their inherent value or "internal satisfaction," could induce a shift in motivational orientation from extrinsic to intrinsic (i.e., autonomous) motivation (Watts, Fullard and Peterson, 2021, p. 79). To be clear, this is not a new hypothesis; it is the same hypothesis only viewed from a different angle – one which lends itself readily to empirical evaluation.

To test this hypothesis, the study required a sample of children who were exclusively extrinsically motivated to engage in two activities: one virtuous and one morally neutral (see *Participants* and *Procedure*). Children's intrinsic motivation was measured over time and compared between groups. The lure hypothesis predicts that those engaged in the virtuous activity would show greater increases in intrinsic motivation compared to those engaged in the neutral activity.

The study employed a mixed factorial design with one between-subjects factor (Group: *Intervention* vs *Control*) and one within-subjects factor (Time: *Pre*-intervention, *Post*-intervention, and three-week *Follow-up*). Intrinsic motivation was measured via an adapted Intrinsic Motivation Inventory consisting of three subscales: *Interest/Enjoyment*, *Value/Usefulness*, and *Perceived Choice* (see *Materials and Measures*). To minimise expectancy effects, participants were not informed of their group allocation (partial blinding). Counterbalancing was not applicable because all participants completed the same measures in the same fixed order at each timepoint. This design allowed for the testing of main effects and interaction effects. The key prediction was a Group × Time interaction, indicating greater increases in intrinsic motivation for the intervention group relative to the control group. Presuming internal validity is preserved, this design supports cautious causal inference (Field, 2024).

**Participants**

The final sample consisted of 22 Year 7 students (aged 11–12) from a mixed-gender, inner-city comprehensive school in the Midlands. The school was selected for convenience as I work there full-time as a maths teacher. Year 7 was chosen because the lure hypothesis is expected to be particularly applicable to "younger pupils" (Watts, Fullard and Peterson, 2021, p. 79). A purposive sampling method was used to ensure that exclusively extrinsically motivated students were included (see *Procedure*). Intrinsically motivated students were excluded to protect the integrity of the study (avoiding potential ceiling effects) and to safeguard their own

motivation from the well-documented undermining effect of extrinsic rewards (Ryan and Deci, 2017).

The target sample size was 60 students. This number was selected to provide sufficient statistical power to detect meaningful change while remaining feasible within the logistical constraints of the school and accounting for potential attrition. The initial sample consisted of 61 students, who were allocated to the intervention or control group using matched allocation by tutor group. This was done to minimise tutor-related influences (e.g., varying levels of encouragement). Although some tutor groups contributed more participants than others, matched allocation ensured that each group's participants were split evenly across the groups.

Participants were included in the final analysis only if they attended at least five of the six journaling sessions, completed intrinsic motivation measures at all three timepoints with no more than minimal missing data, and provided assent for data usage. Students not meeting these criteria were excluded prior to scoring or imputation. Of the 61 students initially recruited, 22 met the final inclusion criteria: 10 in the intervention group (5 girls, 5 boys) and 12 in the control group (8 girls, 4 boys). Gender balance across groups was reasonably even, reducing the likelihood of gender-related confounds.

**Materials and Measures**

Participants' intrinsic motivation was measured using an adapted version of the Intrinsic Motivation Inventory (IMI; Ryan, 1982; Ryan, Mims and Koestner, 1983) – a multidimensional instrument widely used in studies on intrinsic motivation and self-regulation (e.g., Coa and Patrick, 2016; Deci *et al*., 1994; Plant and Ryan, 1985; Ryan, Connell and Plant, 1990; Ryan, Koestner and Deci, 1991; Tyack and Mekler, 2020; see also Ryan and Deci, 2017). The 25-item version used in this study, originally validated by Deci *et al*. (1994) in a study on internalisation, includes three subscales: *Interest/Enjoyment*, *Value/Usefulness*, and *Perceived Choice*. The *Interest/Enjoyment* subscale is the most direct self-report measure of intrinsic motivation. *Perceived Choice* reflects the extent to which participants feel autonomous in their behaviour

and is thought to predict both self-report and behavioural indicators of intrinsic motivation. *Value/Usefulness*, while not itself a measure of intrinsic motivation, is thought to predict internalisation – the process by which extrinsically motivated behaviours become self-endorsed (Deci *et al.*, 1994). These subscales have demonstrated consistent factor structure and validity across a range of experimental contexts (McAuley and Tammen, 1989).

To improve accessibility for 11–12-year-olds, the original IMI was slightly adapted. The 7-point response scale (1 = "not at all true" to 7 = "very true") was presented after each item, rather than once at the top of the survey, to allow participants to circle their response more easily. Minor wording changes were made to improve readability. For instance, on the response scale, "somewhat true" was changed to "a bit true," and some items were shortened or simplified. Item 18, for example, was revised from "I believe doing this activity could be somewhat beneficial for me" to "I believe doing this activity could be beneficial for me." To maintain consistency across the two groups, context-specific references were removed or generalised (e.g., item 4 was shortened to "I believe that doing this activity is useful"). One item (13) was removed entirely due to its unsuitability for truncation. The questionnaire was printed in Comic Sans MS for improved legibility (see Appendix A for the full questionnaire).

Six items (8, 12, 13, 17, 19, 23) were reverse scored by subtracting the participant's response from 8. Subscale scores were then calculated by averaging across all relevant items. The items comprising each subscale are detailed in Table 1.

**Table 1**

*IMI Subscale Items*

| Subscale | Items |
|---|---|
| *Interest/Enjoyment* | 3, 5, 7, 11, 12(R), 14, 16, 22 |
| *Value/Usefulness* | 1, 4, 6, 10, 15, 18, 20, 24 |
| *Perceived Choice* | 2, 8(R), 9, 13(R), 17(R), 19(R), 21, 23(R) |

**Intervention**

To evaluate the lure hypothesis, the intervention needed to involve extrinsically motivated engagement in both a virtuous (intervention) and morally neutral (control) activity. Originally, I had planned for the experimental group to engage in service-oriented activities (e.g., visiting a care home), while the control group completed a neutral academic task. However, these plans posed logistical challenges and introduced too many uncontrolled variables. Instead, I sought a single school-based activity that could have both a virtuous and neutral aspect – journaling emerged as an ideal candidate. This choice was inspired by prior studies on gratitude interventions (Emmons and McCullough, 2003; Froh, Sefick and Emmons, 2008; Froh *et al*., 2014; see also Bono *et al*., 2022; Chaplin *et al*., 2018).

Each session, participants received a sheet with five blank lines (Emmons and McCullough, 2003; Froh, Sefick and Emmons, 2008). Those in the experimental group were prompted to "write down five things in your life that you are grateful or thankful for" – a standard gratitude journaling prompt (Froh, Sefick and Emmons, 2008). The control group, by contrast, was asked to "write down five things that you have done" (Froh *et al.*, 2014). To ensure depth of engagement, participants were also required to explain *why* they had listed each item. The same sheets were used each week to maintain consistency (see Appendices B and C for the journaling sheets). The journaling activities were administered as drop-in sessions on Tuesday lunchtimes in adjacent classrooms. I supervised the gratitude group, while a colleague supervised the control group. The intervention lasted for six consecutive weeks, in line with Froh *et al.* (2014).

One might question, here, whether gratitude journaling is a truly virtuous activity. While gratitude is undeniably a moral virtue (Kristjánsson *et al.*, 2017; Morgan, Gulliford and Kristjánsson, 2017), it typically involves outward expression toward others (Gulliford and Roberts, 2018). Journaling, by contrast, is introspective. In response, I would suggest that even if gratitude journaling does not express the behavioural component of gratitude, it may still

engage other internal components (e.g., emotion). Moreover, what matters for present purposes is not that gratitude journaling *fully* instantiates a moral virtue, but rather that the activity is *more* virtuous than the morally neutral control activity (generic journaling). Thus, we might still expect those engaged in gratitude journaling to make significantly greater gains in intrinsic motivation compared to those in the control group – as predicted by the lure hypothesis. Indeed, gratitude has been shown to satisfy the basic psychological needs of autonomy, competence, and relatedness (Kashdan *et al.*, 2009; Wood, Joseph and Maltby, 2009; Tian *et al.*, 2016) – all of which are linked to enhanced intrinsic motivation (Ryan and Deci, 2017).

**Procedure**

***Recruitment***

Recruiting for the study required identifying students who were exclusively extrinsically motivated to engage in the journaling activities. Intrinsically motivated students needed to be excluded (see *Participants* and *Design*). This was achieved through a staged recruitment process conducted in the first week of the spring half-term. I visited each Year 7 tutor group (approximately 180 students in total) with the aim of recruiting 60 participants (see *Participants*). After handing the tutor a paper register and a pen, I described a new enrichment opportunity: a lunchtime journaling activity where students could reflect on things they had recently done or things they were grateful for (see *Intervention*). No mention of rewards was made at this stage. I then asked who would be interested in taking part. Tutors were instructed to place a cross next to the names of students who raised their hands. Seventeen students (9 girls, 8 boys) did so. These students were deemed intrinsically motivated and excluded from the study. Only then did I add: "Oh, I almost forgot to mention, each time you participate in one of these journaling sessions, you will receive 20 PRIDE Points. So, if you complete all six sessions, that's a total of 120 PRIDE Points!" Tutors then placed a tick next to the names of students who now raised their hands (see Appendix D for the full screening script; Brown, 2024a). 61 students did so (29 girls, 32 boys), forming the initial sample. These 61 students were allocated to

gratitude journaling (n = 31) or generic journaling (n = 30) using matched allocation by tutor group (see *Participants*). To minimise attrition, students were required to attend all six sessions to receive the reward.

A note on PRIDE Points: At my school, PRIDE Points function as a kind of currency. Students earn them for desirable behaviours and can spend them in the "PRIDE Shop" on items such as stationery, confectionery, and small toys. In psychological terms, this type of reward is known as a *tangible*, *expected*, *completion-contingent reward* – the worst offender when it comes to undermining intrinsic motivation (Ryan and Deci, 2017, pp. 131–139).

***Baseline Data Collection (Pre-Test)***

The intervention was scheduled to begin the week after recruitment. On the Monday morning of that week, I visited each Year 7 tutor group to remind students where to go for the journaling sessions. I also put up posters around the Year 7 space with room information and shared digital copies with tutors to include in Tuesday's tutor-time presentations (see Appendix E for the poster). Students were reminded that group allocations were fixed and that swapping classrooms would not be allowed. During this visit, I also spoke to the 17 students who had expressed interest in journaling before any mention of PRIDE Points – those identified as intrinsically motivated. I explained that the activity was currently oversubscribed, but they would have the same opportunity to participate the following term (after the study's aims had been disclosed; see *Ethics*).

However, shortly before the first session, I discovered that the room numbers on the posters were incorrect. I tried to mitigate this error by emailing Year 7 staff, leaving notes on the incorrect doors, and redirecting students in person – but only 33 students showed up, rather than the expected 61. To ensure consistency, I decided not to collect baseline data that week.

The following Monday, I visited tutor groups again, explained the mix-up, and informed students that the study would restart that week, reassuring them that they could still earn the full PRIDE Points reward by attending the five remaining sessions. That Tuesday, 31 students

attended – still much lower than expected (barely half of the initial sample). But, after completing their journaling activities, students were nevertheless asked to fill in the Intrinsic Motivation Inventory (IMI; see *Materials and Measures*). The baseline measure could not be further postponed.

***Intervention Period***

Throughout the six-week intervention period, students received multiple reminders about the upcoming journaling sessions. On Monday mornings, I visited Year 7 tutor groups in person. On Monday evenings, I emailed tutors to remind students again during Tuesday's tutor time. On Tuesday lunchtimes, I gave further verbal reminders while walking through the Year 7 space. I became colloquially known as "the journaling teacher."

Initially, students were asked to arrive at the start of lunch; however, many preferred to get food first. The sessions were therefore restructured as drop-in sessions: for half an hour each Tuesday lunchtime, my colleague and I supervised the gratitude and control groups in adjacent classrooms (see *Intervention*), and students could attend at any point during this period. Attendance was recorded each week to monitor compliance with the minimum participation required for inclusion in the final analysis. Facilitators used a standardised script to introduce the activity and offered no feedback on journal content, helping maintain consistency and reduce potential influence on student responses.

***Post-Test and Follow-Up***

After the sixth and final journaling session, students again completed the IMI (see *Materials and Measures*). The original attendance requirement of six sessions was relaxed to five to accommodate unavoidable absences (e.g., due to illness, room confusion, school events). Twenty-two students satisfied the final inclusion criteria: 10 in the gratitude group, 12 in the control group (see *Participants*). PRIDE Points were awarded the following day: 20 points awarded per session attended.

Three weeks later, during the first week back after the Easter holiday, the same 22 students completed the IMI for a third time to assess sustained motivational change. Immediately afterwards, students were debriefed on the aims of the study, invited to provide assent, and given parental consent letters to take home (see *Ethics*). Only one student declined assent. In all, the study timeline spanned ten weeks: one week for recruitment, six weeks of intervention, and a three-week gap before follow-up data collection (see Appendix F for a timeline summary).

The following week, I returned to tutor groups to speak with the 17 students who had expressed interest in journaling prior to mention of rewards – those screened out as intrinsically motivated. After explaining the rationale for their exclusion and the aims of the study, I invited them to participate in a new six-week cycle of Tuesday lunchtime journaling sessions.

## Ethics

### *Deferred Consent and Data Handling*

A key ethical consideration in this study was the use of deferred consent. Disclosing the study's objectives upfront could have influenced participants' motivation, thereby compromising the study's internal validity. To preserve methodological rigour and ethical standards, a staged consent process was used:

1. **Institutional approval** – The headteacher provided informed consent on behalf of the school after receiving a full briefing on the study's aims, methods, and ethical safeguards (see Appendix G for gatekeeper consent).
2. **Description of activities** – Students and parents were informed about the journaling activities (gratitude and generic) as part of an optional enrichment programme. A parental letter (Appendix H) outlined these activities without referencing their role in a research study – to avoid expectancy and self-selection bias.
3. **Post-intervention debriefing and student assent** – Following the final follow-up data collection, students attended a debriefing session where the study's aims and

rationale for deferred consent were explained. They were then invited to sign age-appropriate assent forms (Appendix I) and given a two-week window to request withdrawal of their data.

4. **Parental consent** – A follow-up letter (Appendix J) was sent to parents explaining the study's aims and providing the same two-week opportunity to opt their child out of the study.

***Use of Extrinsic Rewards***

Ethical research guidelines emphasise that participation in research should be *voluntary* (BERA, 2024; BPS, 2021). In this study, however, participation was necessarily incentivised using extrinsic rewards – namely, PRIDE Points. A child who participates solely to earn a reward cannot be said to have fully volunteered (if at all). This introduces an ethical tension: a participant may want the reward but feel reluctant to complete the task, potentially resulting in a sense of coercion or external control.

This risk was mitigated in several ways. Participants were explicitly informed that the journaling activities were optional and that withdrawal would result only in forfeiting unearned rewards. They were also reminded that PRIDE Points could be earned through other school activities, reducing the sense of dependency on the intervention. These reassurances were communicated clearly during recruitment and reiterated throughout the six-week intervention period.

***Exclusion of Intrinsically Motivated Students***

Students who were already intrinsically motivated to engage in journaling were excluded from participation. While necessary for both methodological and ethical reasons (see *Participants* and *Design*), this exclusion may have appeared unfair to those students and could have impacted their motivation (Gubler, Larkin and Pierce, 2016).

To mitigate this risk, the students were informed that the activity was oversubscribed and assured that they would have the same opportunity the following term (once the study's

aims had been disclosed). Their interest and motivation were acknowledged and positively redirected: they were invited to take on character leadership roles, helping to design activities to promote gratitude across the school. This initiative was intended to safeguard their intrinsic motivation by fostering autonomy, competence, and relatedness – three psychological needs central to motivation and well-being (Ryan and Deci, 2017).

**Data Analysis Plan**

Data for each IMI subscale (*Interest/Enjoyment*, *Value/Usefulness*, and *Perceived Choice*) were analysed using a 3 (Time: *Pre*, *Post*, *Follow-up*) × 2 (Group: *Intervention* vs *Control*) mixed factorial ANOVA. Although the IMI developers recommend factor analysis for adapted versions of the scale (Self-Determination Theory, no date), the limited sample size in the present study precluded this. Internal consistency for each subscale was instead assessed using Cronbach's alpha. This statistic indicates how closely related a set of items are as a group, with higher values suggesting greater internal reliability (Nunnally, 1978). Prior to analysis, assumptions of *normality* (skewness, kurtosis, Shapiro-Wilk test), *sphericity* (Mauchly's test; Greenhouse-Geisser correction applied if violated), and *homogeneity of variance* (Levene's test) were checked. All analyses were conducted in Jamovi with an alpha level of .05. Where appropriate, partial eta squared ($\eta^2_p$) was reported alongside *p*-values to aid interpretation. Significant effects were followed up with Bonferroni-adjusted post hoc comparisons.

Missing data were handled conservatively: if at least 80% of items on a subscale at a given timepoint were completed and internally consistent, the participant's mean score for the completed items was used to impute missing values; otherwise, the subscale score for that timepoint was excluded from analysis. In practice, imputation was used for only six item responses out of 1,584 (22 participants × 24 items × 3 timepoints), and only one subscale score (for one participant at one timepoint) was excluded due to internal inconsistency.

## Results

### Internal Reliability

Cronbach's alpha was used to assess the internal consistency of each subscale on the adapted Intrinsic Motivation Inventory (IMI) at each timepoint (Table 2). Values indicate good internal consistency ($\alpha > .80$) for the *Interest/Enjoyment* subscale at all timepoints and for the *Value/Usefulness* subscale at *Pre*-test. Internal consistency was acceptable ($\alpha > .70$) for *Value/Usefulness* at *Post* and *Follow-up*, and for *Perceived Choice* at *Pre* and *Post*. However, the *Perceived Choice* subscale fell below the conventional threshold for acceptable reliability at *Follow-up* ($\alpha = 0.609$), suggesting potential measurement inconsistency at that timepoint (Nunnally, 1978).

**Table 2**

*Cronbach's Alpha (α) for each IMI Subscale at each Timepoint*

| IMI Subscale | Timepoint | | |
|---|---|---|---|
| | 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 |

### Descriptive Statistics

The tables below present descriptive statistics for each IMI subscale – *Interest/Enjoyment* (Table 3), *Value/Usefulness* (Table 4), and *Perceived Choice* (Table 5) – by group (*Control*, *Intervention*) and across timepoints (*Pre*, *Post*, *Follow-up*). Mean, median, standard deviation, skewness, kurtosis, and Shapiro-Wilk test results are reported. The data indicate modest variation in central tendency across time and between groups, with most distributions showing acceptable symmetry and kurtosis (West, Finch and Curran, 1995). Shapiro-Wilk test results suggest no major violations of normality, though a few variables in the

*Perceived Choice* subscale (notably in the intervention group) approach or exceed significance thresholds ($p < .05$), suggesting potential non-normality (Ghasemi and Zahediasl, 2012). Nevertheless, given that ANOVA is generally robust to minor normality violations in small samples (Blanca *et al.*, 2017; Field, 2024), all data were retained for further analysis.

**Table 3**

*Descriptive Statistics for* Interest/Enjoyment *Subscale*

| Descriptive | Group | Pre | Post | Follow-up |
|---|---|---|---|---|
| Mean | Control | 4.99 | 5.14 | 5.24 |
| | Intervention | 4.62 | 5.27 | 4.63 |
| Median | Control | 4.88 | 5.13 | 5.38 |
| | Intervention | 4.78 | 5.06 | 4.56 |
| Standard deviation | Control | 1.27 | 1.03 | 1.01 |
| | Intervention | 1.09 | 1.44 | 1.38 |
| Skewness | Control | 0.102 | -0.657 | -0.181 |
| | Intervention | -0.422 | -0.455 | -0.578 |
| Kurtosis | Control | -1.14 | 2.44 | -0.159 |
| | Intervention | -1.11 | -0.133 | 1.39 |
| Shapiro-Wilk *p* | Control | 0.815 | 0.386 | 0.996 |
| | Intervention | 0.368 | 0.394 | 0.576 |

**Table 4**

*Descriptive Statistics for* Value/Usefulness *Subscale*

| Descriptive | Group | Pre | Post | Follow-up |
|---|---|---|---|---|
| Mean | Control | 5.18 | 5.43 | 5.49 |
| | Intervention | 4.94 | 5.21 | 4.95 |
| Median | Control | 4.81 | 5.31 | 5.56 |
| | Intervention | 4.50 | 5.44 | 4.94 |
| Standard deviation | Control | 0.991 | 0.886 | 0.838 |
| | Intervention | 1.24 | 0.978 | 0.718 |
| Skewness | Control | 1.03 | 0.592 | 0.465 |

| Descriptive | Group | Pre | Post | Follow-up |
|---|---|---|---|---|
| | Intervention | 0.945 | -0.773 | -0.105 |
| Kurtosis | Control | 0.120 | -0.649 | -0.591 |
| | Intervention | -0.445 | 0.636 | -1.56 |
| Shapiro-Wilk *p* | Control | 0.068 | 0.269 | 0.488 |
| | Intervention | 0.050 | 0.353 | 0.419 |

**Table 5**

*Descriptive Statistics for* Perceived Choice *Subscale*

| Descriptive | Group | Pre | Post | Follow-up |
|---|---|---|---|---|
| Mean | Control | 5.33 | 5.98 | 5.54 |
| | Intervention | 5.46 | 5.86 | 5.88 |
| Median | Control | 5.69 | 5.88 | 5.50 |
| | Intervention | 5.97 | 6.63 | 6.13 |
| Standard deviation | Control | 1.09 | 0.648 | 0.726 |
| | Intervention | 1.08 | 1.34 | 1.01 |
| Skewness | Control | -0.302 | 0.311 | 0.163 |
| | Intervention | -0.427 | -0.861 | -0.778 |
| Kurtosis | Control | -1.23 | -1.06 | 0.719 |
| | Intervention | -1.92 | -1.31 | -0.424 |
| Shapiro-Wilk *p* | Control | 0.233 | 0.384 | 0.991 |
| | Intervention | 0.028 | 0.013 | 0.241 |

**Assumption Checks**

Before conducting repeated-measures ANOVAs, key assumptions were assessed. Normality was examined above using skewness, kurtosis, and Shapiro-Wilk values. Mauchly's test showed that the assumption of sphericity was met for all subscales across the Time factor ($p > .05$), so no corrections were necessary (Field, 2024). Levene's test showed that the assumption of homogeneity of variance was satisfied for most conditions ($p > .05$), apart from the *Perceived Choice* subscale at the *Post*-test timepoint ($F(1,19) = 10.79$, $p = .004$), where variance differed significantly between groups. Again, given the robustness of ANOVA to minor

assumption violations (Blanca *et al.*, 2017; Field, 2024), along with the exploratory nature of the study, all analyses proceeded. Still, results involving this timepoint should be interpreted with caution.

**Inferential Statistics**

Data for each subscale were analysed using a 2 (Group: *Intervention* vs *Control*) × 3 (Time: *Pre*, *Post*, *Follow-up*) mixed factorial ANOVA. The lure hypothesis, recall, predicts a significant Group × Time interaction, particularly on the *Interest/Enjoyment* subscale – the key indicator of intrinsic motivation.

***Interest/Enjoyment***

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

***Value/Usefulness***

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

***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 ($F(2, 38) = 3.47$, $p = .041$, $\eta^2_p = .154$). Pairwise comparisons (Bonferroni-adjusted) showed a statistically significant increase in *Perceived Choice* from *Pre* ($M = 5.43$, $SE = 0.243$) to *Post* ($M = 5.92$, $SE = 0.220$), $p = .027$. Other comparisons (*Pre* vs *Follow-up* and *Post* vs *Follow-up*) were not significant.

A summary of all inferential statistics across subscales is provided in Table 6. A visual summary of group trends across time is provided in Figure 1.

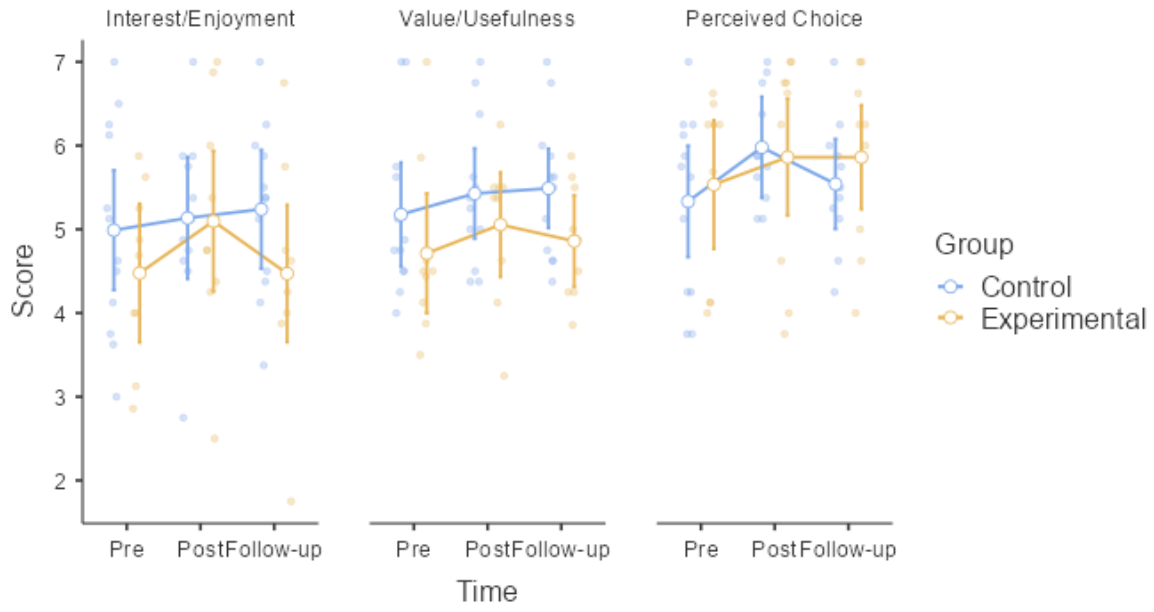
**Table 6**

*Summary of Inferential Statistics Across IMI Subscales*

| Subscale | Effect | *F* (df) | *p* | $\eta^2_p$ | Significant? |
|---|---|---|---|---|---|
| Interest/Enjoyment | Time × Group | *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 | Time × Group | *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 | Time × Group | *F*(2, 38) = 0.75 | .479 | .038 | ✗ |
| | Group | *F*(1, 19) = 0.12 | .732 | .006 | ✗ |
| | Time | *F*(2, 38) = 3.47 | .041 | .154 | ✓ |

**Figure 1**

*Mean Scores on IMI Subscales by Group and Timepoint*




*Note*. Lines indicate group means with standard errors. Dots represent individual participant scores.

### Summary of Findings

In summary, there was no significant Group × Time interaction or main effect of Group for any subscale. There was also no significant main effect of Time for *Interest/Enjoyment* or *Value/Usefulness*. There was a significant increase in *Perceived Choice* from *Pre* to *Post*, although this effect was not sustained at *Follow-up*. However, internal reliability for this subscale fell below acceptable levels at *Follow-up*, limiting confidence in that null result.

## Discussion

Before interpreting findings, it is important to reiterate several limitations at the outset: the small sample size meant the study was statistically underpowered; internal consistency for the *Perceived Choice* subscale fell below acceptable levels at *Follow-up*, suggesting measurement inconsistency at that timepoint; and the assumption of homogeneity of variance was violated for *Perceived Choice* at *Post*-test, which may affect the validity of between-group comparisons. Due to these limitations, results should be interpreted with caution and viewed as preliminary.

### Evaluating the Lure Hypothesis

It makes sense to begin by returning to the debate between Watts, Fullard and Peterson (2021, 2022) and Berkowitz (2021, 2022). Watts, Fullard and Peterson (2021, 2022), recall, argue in favour of the lure hypothesis; Berkowitz (2021, 2022) strongly disagrees. What can the present study contribute to this exchange? Unfortunately for Watts, Fullard and Peterson (2021, 2022), results offered no evidence in favour of their lure hypothesis: there were no significant Group × Time interactions. I will discuss three possible explanations, the last of which contains three sub-possibilities.

The first possible explanation is that the lure hypothesis, as proposed by Watts, Fullard and Peterson (2021, 2022), is simply incorrect. Perhaps engaging in morally virtuous behaviours (e.g., gratitude journaling) offers no particular advantage in facilitating the internalisation of motivation compared with morally neutral activities (e.g., generic journaling). We may go a step

further. The lure hypothesis, recall, can be seen as the contrapositive of the well-documented "undermining" effect of extrinsic rewards: if rewards can shift motivation *outward* in those who start off internally motivated (Ryan and Deci, 2017), it seems reasonable to hypothesise that engaging in intrinsically valuable behaviour – those that instantiate moral virtues – might shift motivation *inward* in those who start off extrinsically motivated (e.g., via rewards). This argument assumes that morally virtuous behaviours are indeed intrinsically valuable – that is, their value manifests in the behaviour itself. Perhaps this is mistaken. Perhaps such behaviours are not intrinsically valuable, but only instrumentally so (if at all). This line of reasoning brings us closer to Besser-Jones's (2014) instrumentalist version of *eudaimonic* ethics (and, by extension, character education), whereby virtuous behaviours are valuable only insofar as they promote the satisfaction of basic psychological needs (cf. Kristjánsson, 2017).

The second possible explanation is that the study was underpowered. A G*Power sensitivity analysis indicated that with a final sample of 22 participants, the study could only reliably detect effects of $f \geq 0.28$ – slightly above the conventional threshold for a medium effect (Cohen, 2013). Smaller effects may have gone undetected. It is possible, therefore, that the lure hypothesis is correct, but that any genuine effect in this sample was too small to detect.

The third possible explanation is that the difference between the intervention group (gratitude journaling) and control group (generic journaling) was not morally salient enough. This could have been for several reasons. First, perhaps gratitude journaling fails to sufficiently manifest the virtue of gratitude. After all, gratitude is an *inter*personal virtue (Gulliford and Roberts, 2018), whereas journaling is an *intra*personal exercise. In the *Intervention* sub-section, I argued that gratitude journaling might nevertheless induce the emotional aspect of gratitude, allowing students to feel the internal satisfaction of the behaviour. I might have been wrong.

Second, perhaps the intervention activity was not different enough from the control activity. Once the activities had been explained, students largely worked on their own; many took their journal sheets home; journal entries were not routinely monitored. As such, it

plausible – likely, even – that students in the generic journaling group sometimes wrote about things that they were grateful for, while those in the gratitude journaling group sometimes wrote things that they had done but were not really grateful for. Moreover, some students were very much just going through the motions in order to earn the reward. Efforts were made to exclude such cases from the analysis, but some may have slipped through.

Third, perhaps the intervention was not long enough or frequent enough for the difference between the groups to sufficiently manifest. In this study, students engaged in journaling once per week for six weeks. A longer intervention, perhaps 12 weeks, or a period of daily journaling over one or two weeks, might have produced a clearer effect. Evidence from prior work is mixed: Froh, Sefick and Emmons (2008) used daily gratitude journaling for two weeks, whereas Froh *et al*. (2014) used a weekly format for five weeks. Lyubomirsky *et al*. (2011) suggest that gratitude interventions may be more effective when spaced further apart, hence the present study's weekly schedule.

It is important to remember, however, that the focus of this study was not gratitude per se. Any virtue-manifesting behaviour would have sufficed. Gratitude journaling was chosen mainly because it was easy to administer in school. The focus of the study was *motivation*. At the end of their seminal article on the undermining (then "overjustification") effect, Lepper, Greene and Nisbett (1973) acknowledge something akin to the lure hypothesis, suggesting that extrinsic incentives may be particularly effective when an activity's appeal becomes apparent only after extended engagement or the attainment of some minimal level of mastery. Perhaps, then, six weeks of gratitude journaling was insufficient for students to reach this threshold. With more sustained practice – whether in duration or frequency – students might have become better at manifesting gratitude in their writing, potentially leading to a differential effect between groups. However, increased practice would also likely enhance mastery in the control group – so a Group × Time interaction still might not emerge. This brings us back to the central question

of whether there is anything special about virtue-manifesting behaviours, and, if so, whether this difference was palpable between the groups.

Whatever the explanation, findings from this study do not vindicate Watts, Fullard and Peterson (2021, 2022). But nor do findings support Berkowitz's (2021, 2022) position. Berkowitz (2021), recall, maintains that: (1) intrinsic motivation is essential for character development; (2) extrinsic rewards undermine intrinsic motivation; therefore, (3) extrinsic rewards have no place in character education (see *Literature Review*). Importantly, Berkowitz's usage of the term "intrinsic motivation" does not refer exclusively to behaviours performed for their inherent satisfactions – as per SDT's definition (Ryan and Deci, 2017) – but more generally to internalised or autonomous regulation. His second premise, that rewards undermine autonomous motivation, seems consistent with evidence from SDT (Bartholomew, Ntoumanis and Thøgersen-Ntoumani, 2009; Ryan and Deci, 2017) – at least for individuals who are already autonomously motivated. But what about those who start off unmotivated? This was the question that saw Berkowitz's (2021) argument unravel, creating theoretical space for claims such as the lure hypothesis.

Although no significant Group × Time interaction emerged – contra Watts, Fullard and Peterson's (2021, 2022) lure hypothesis – there *was* a significant main effect of Time, from *Pre* to *Post*, for the *Perceived Choice* subscale. In other words, perceived autonomy rose immediately after the intervention. One might conclude, tentatively, that rewards can be used to lure children into developing more autonomous motivation – contra Berkowitz (2021). The reason that Watts, Fullard and Peterson (2021, 2022) cannot straightforwardly declare victory is that this effect was observed *across both groups* – there was nothing special about the moral activity that resulted in greater perceived autonomy compared to the control activity. As discussed in the *Literature Review*, however, Watts, Fullard and Peterson (2021, 2022) are not the only ones to suggest something akin to the lure hypothesis. There are other, more general formulations. Warnken and Tomasello (2008), for example, suggest that rewards may be beneficial when

children's motivation is very low, while Benninga (2020) argues that incentives for initially unappealing activities can positively influence later behaviours. Present findings lend support to both claims (assuming that an increase in perceived autonomy counts as a positive effect, a point I will return to shortly) and, more generally, to any theory of moral development involving progression from heteronomy to autonomy (e.g., Jubilee Centre, 2022; Kohlberg, 1981; Piaget, 1932). Findings also suggest a solution (albeit a rather underwhelming one) to Peters' (1981) "paradox of moral education" – namely, that the transition to autonomy may emerge simply from sustained engagement, regardless of the activity's moral content. How might this effect be explained? That is, why did participants' perceived autonomy increase immediately after the intervention, regardless of group? I will discuss two possible explanations.

The first possible explanation is that autonomy perceptions grew as the journaling activities – whether gratitude or generic – became incorporated into participants' weekly routines. In a study on consumption habits, Ji and Wood (2007) found that participants with stronger habits reported greater certainty in their intentions, even though these intentions did not reliably predict later behaviour (see also Mazar and Wood, 2021). Assuming a positive relationship between "certainty in intentions" and "perceived autonomy," this could also explain why the effect faded by *Follow-up* (measurement inconsistency withstanding): once the activity disappeared from the weekly routine, the accompanying sense of autonomy likely diminished as well. Observe, further, that this reverses the order suggested by Watts, Fullard and Peterson (2021, p. 79; quoted above): it is not that habit formation follows feelings of autonomy, but rather that feelings of autonomy follow habit formation.

The second possible, albeit more speculative, explanation is that the increase in perceived autonomy reflected a kind of psychological defence mechanism. Within SDT, autonomy is one of three basic psychological needs essential for healthy development (Ryan and Deci, 2017). Prolonged engagement in externally regulated behaviours could threaten this development. In such situations, it is plausible that individuals might unconsciously downplay

or even forget the external contingencies shaping their behaviour, thereby allowing for the perception of autonomy. In other words, we may gradually convince ourselves that our behaviour is more self-determined than it really is in order to protect our psychological well-being – self-soothing via a form of self-deception.[3]

I must admit, I find the significant main effect of Time for *Perceived Choice* somewhat disconcerting. It suggests that feelings of autonomy in young people can be induced simply through repeated engagement with a behaviour – regardless of the moral content of that behaviour. Suppose I wanted a child to feel autonomous with respect to vicious behaviour such as bullying. Results suggest that all I need to do is ensure sufficient engagement – through the lure of rewards, perhaps – until the behaviour has become habitual, and feelings of autonomy could follow. While some vicious behaviours may be immediately unpleasant to enact and thus resistant to habit formation, others may be more neutral or even rewarding in the short term, enabling the formation of harmful habits. This possibility, though troubling, is not entirely surprising: it may reflect the minimal psychological basis necessary for nefarious practices such as grooming, indoctrination, and radicalisation, which are sadly all too common.

In sum, the present findings do not support Watts, Fullard and Peterson's (2021, 2022) specific formulation of the lure hypothesis. Two factors most likely contribute to this: first, the study was underpowered, so small effects might have gone undetected; second, the difference between the intervention and control activities was not morally salient enough. Nevertheless, the significant main effect of Time for *Perceived Choice* subscale challenges Berkowitz's (2021) claim that rewards undermine autonomous motivation, and supports more general formulations of the lure hypothesis (Warneken and Tomasello, 2008; e.g., Benninga, 2020). On balance, the study provides tentative support for the broader proposition that autonomous motivation can be induced via the lure of rewards.

[3] Cf. Festinger's (1957) theory of cognitive dissonance.

Three final points are worth noting. First, the present study offers no insight into the strategy of "weaning students off" rewards (Berkowitz, 2021), as the entire reward (120 PRIDE Points) was administered immediately after the intervention. The weaning strategy could be evaluated by frontloading rewards, although this approach may result in greater attrition.

Second, while the primary focus of this study was motivation rather than gratitude per se, it is worth briefly considering the implications for gratitude-specific research. Recent work maintains that gratitude is associated with a wide range of benefits throughout life, including at school (e.g., Emmons, Froh and Rose, 2019; Viswanath and Kumar, 2025). Here, reflective journaling increased students' perceived autonomy regardless of whether they were engaged in gratitude journaling or generic journaling, raising interesting questions about the relationship between reflection and gratitude. Does gratitude necessarily involve reflection? Perhaps it does: Hebbink, de Ruyter and Schinkel (2025) characterise gratitude as "a reflective awareness of our dependence on something beyond ourselves" (p. 20). And if gratitude does require reflection, to what extent do the positive outcomes associated with gratitude depend on its reflective component? This question could be addressed by replicating classic gratitude interventions while controlling for reflection – an approach that, to my knowledge, is yet to be tested.

Finally, a note on behaviourism: Suppose you start with a group of participants who are intrinsically motivated to engage in a certain activity. You reward some for their engagement (intervention group), but not others (control group). What effect will this have on participants' subsequent motivation? This was the question that originally divided SDT and behaviourism: SDT predicted a Group × Time interaction, namely, that motivation in the intervention group would decrease relative to the control group (Deci, 1971); behaviourism disagreed, predicting that motivation would return to baseline – because, on this view, "intrinsic motivation" is a spurious construct (e.g., Carton, 1996; see *Literature Review*). SDT seemingly won that argument; hence the "undermining effect" of extrinsic rewards (Deci, Koestner and Ryan, 1999). Returning to the present study, the lure hypothesis asserts the *contrapositive* of the

undermining effect – so the predictions and outcome should be the same.[4] The study started with a group of participants who were extrinsically motivated via rewards. Some engaged in an "internally satisfying" activity, that is, an activity shown to satisfy innate psychological needs (gratitude journaling; intervention group), while others engaged in a more neutral activity (generic journaling; control group). What effect did this have on participants' subsequent motivation? As before, SDT predicts a Group × Time interaction, although this time motivation in the intervention group should *increase* relative to the control group; behaviourism disagrees, predicting similar effects across the groups – because, on this view, there is no such thing as "innate psychological needs" (only external reinforcement contingencies; Skinner, 1971). This time, the behaviourist prediction was closer to the mark: no Group × Time interaction emerged, only a main effect of Time. Of course, this does not necessarily mean that behaviourism is the correct theory; as discussed, it could simply mean that the intervention and control activities were insufficiently different. Nevertheless, future research might consider revisiting this crucial point of contention between behaviourism and SDT.

**Limitations and Future Directions**

A good starting point for future research would be to address limitations of the present study – most importantly, the small sample size. While not uncommon in exploratory, school-based studies (Durlak and DuPre, 2008; Thomas, 2012), this meant the study was powered only to detect medium effects. Detecting smaller effects would require recruiting more participants. This could be achieved by recruiting from a larger population – from multiple year groups, say, or from a larger school – or by improving the conversion rate from initial interest to final inclusion. In this study, a population of 180 Year 7 students yielded an initial sample of 61 extrinsically motivated students, but only 22 met the final inclusion criteria. Several practical factors contributed to this attrition, many of which could be avoided in future studies. The room mix-up for the first journaling session might have discouraged some students from returning. Also,

[4] "Not B, therefore not A" is the *contrapositive* of "A, therefore B" – the two are logically equivalent.

students were initially told they must arrive at the *start* of lunchtime – the prime time for getting food – which may have deterred participation. While the journaling sessions gradually morphed into more flexible "drop-in" sessions, advertising them as such from the outset could have improved retention. Finally, a procedural oversight during the first data collection meant that several students completed only the first page of the four-page IMI survey, rendering their data unusable despite meeting all other inclusion criteria.

That said, detecting a truly small effect ($f = 0.10$; Cohen, 2013) with this design would require a final sample of at least 162 participants. In my school, that would mean almost every student in Year 7, or roughly half Years 7 and 8 combined – a tall order, and one that raises serious logistical difficulties. Activity sessions would need to be run in at least six classrooms simultaneously, each with its own member of staff, or run at multiple points throughout the week. Either option introduces a host of potential confounds. Still, the perfect should not be the enemy of the good. If the present study were run with maximal efficiency, it could yield a final sample of 64 students – two classrooms' worth – which would be enough to detect a small-to-medium effect ($f = 0.16$; Cohen, 2013). This could also yield more stable estimates of internal consistency and reduce violations of statistical assumptions.

On the topic of recruitment, two further points merit attention: First, I had originally assumed that three tutor groups would yield enough participants (at least 32). I was wrong. I ended up recruited from all seven tutor groups over three mornings. However, after that first disappointing day, it is possible that word of the reward contingency spread to other groups. Since my screening procedure relied on students not knowing about the rewards in advance, this could have undermined the process. For example, some extrinsically motivated students might have volunteered alongside autonomously motivated students before I announced the rewards, leading to their inadvertent exclusion from the study. This risk could be reduced by recruiting from all tutor groups at the same time – in a single morning, during a common lesson period, or all at once during a whole-year event such as an assembly.

Relatedly, while not a limitation as such, the recruitment process yielded an interesting interaction. Recall that recruiting only extrinsically motivated students required a novel filtration script. I would first describe the journaling activities and ask who was interested. Students raising their hand at this stage were deemed intrinsically motivated and excluded. Only then would I mention that participation would earn a reward. Students who now raised their hands comprised the initial sample. In one tutor group, after I mentioned the reward, a boy's hand flew up – only for a classmate to exclaim, "You're only doing it for the reward!" The boy looked sheepish and lowered his hand. A fascinating exchange! It suggests that even among 11–12-year-olds, there is already a social norm that doing something *purely* for extrinsic reasons is undesirable, and that peers actively enforce this expectation. Ironically, conforming to such an expectation is itself a form of external regulation. In this case, the boy appeared to choose the lesser of two evils: forgoing the reward rather than risking social disapproval and possible alienation from his peers. This makes sense: after all, relatedness is another one of our basic psychological needs (Ryan and Deci, 2017). Future research might examine the role of peer dynamics more explicitly.

The second major limitation of the present study concerns measurement. Despite being a well-validated tool (Deci *et al.*, 1994; Ryan and Deci, 2017), the Intrinsic Motivation Inventory remains a self-report measure and is therefore subject to the usual limitations: social desirability bias, interpretation bias, limited self-awareness, etc (Paulhus and Vazire, 2007). While some of these general limitations are mitigated via 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, no date). Thus, a student's self-reported motivation may not reflect actual behavioural persistence. Ideally, intrinsic motivation would also be assessed behaviourally – for instance, through engagement with the target during a free-choice period with no reward contingency (Deci, 1971; Ryan and Deci, 2017). Initially, I struggled to think of school-based activities (virtuous and control) that could satisfy this

requirement, hence the exclusive reliance on self-report. With hindsight, however, there are ways in which a free-choice period might be approximated. For example, I might arrive at a scheduled journaling session only to announce that I must attend an important meeting, meaning there will be no supervised session. After reassuring students that they would still receive that week's reward, I could offer them journaling sheets to take home – time at home being conceived as free-choice time. The number of sheets voluntarily taken could serve as a behavioural approximation of intrinsic motivation.

On the topic of measurement, it is important to acknowledge that, due to the room mix-up in the first week, baseline data were not collected until after the second journaling session. This could have threatened validity if key motivational changes occurred after the first session and went unmeasured. However, the lure hypothesis emphasises sustained engagement over time, and a single half-hour session is unlikely to produce meaningful change. So, although not ideal, this limitation is unlikely to have compromised the study's findings.

The third limitation is the one discussed at length above: the need for intervention and control activities with a greater moral contrast. In the present study, students in the intervention group wrote about things they were grateful for. This could be expanded to include other virtues – for example, asking students to record five occasions when they were honest, brave, or kind. Meanwhile, the control group, rather than doing generic journaling (which, as discussed, might easily wander into moral territory), could engage in a wholly neutral task, such as a maths activity.

The present study had another limitation – less methodological, more ethical. Recruiting a sample of extrinsically motivated students required the exclusion of autonomously motivated students – those who expressed interest before rewards were mentioned. This was ethically justifiable for several reasons. First, the lure hypothesis essentially asserts the contrapositive of the undermining effect of extrinsic rewards, which has been replicated hundreds of times (Deci, Koestner and Ryan, 1999), even in prosocial contexts where children lost motivation for

behaviours such as helping (Warneken and Tomasello, 2008). By contrast, the present study examined whether extrinsic rewards might be used to induce intrinsic motivation for virtuous behaviours, potentially yielding a positive outcome for participants. If the former type of study is ethically permissible, there seems little reason to condemn the present one. On the contrary, this study actively recruited children typically excluded from research – the initially unmotivated, who are arguably in greater need of intervention. That said, an ethical concern remains for the autonomous students who were systematically excluded. Exclusion can foster perceptions of unfairness, which can in turn undermine motivation (Gubler, Larkin and Pierce, 2016). To mitigate this, after the intervention, excluded students were fully debriefed on the study's aims and given the same opportunity to participate in journaling and earn the reward. They would also be invited to serve as character leaders in their year group – a role I reasoned could help satisfy their basic psychological needs for autonomy, competence, and relatedness, thus safeguarding their autonomous motivation (Ryan and Deci, 2017).

However, things did not go exactly as planned. Of the seventeen autonomous students excluded from the intervention, only three attended the subsequent journaling sessions. Two explanations seem possible: their motivation may have already been undermined, or – more likely – they simply forgot to attend. During the intervention, students received frequent reminders from myself and their tutors. For the subsequent sessions, I sent the same weekly reminders to tutors, but it is unclear how many reached students. The three regular attendees reported that their tutors usually did not pass along the message. Also, whereas during the intervention period I would shout additional reminders en route to the journaling sessions, I was less vocal for subsequent sessions. So, the most likely explanation for low attendance among autonomously motivated students is that journaling simply was not at the front of their minds.

Regarding the three attendees, there were two other concerns. First, I worried that they were motivated mainly by the reward, meaning their autonomous motivation might still have suffered. In retrospect, rather than rewarding them after each session, it may have been better

to give them the full reward upfront, thus freeing them of the ongoing contingency. Second, few meaningful conversations occurred regarding roles as character leaders. I had planned to wait for more students to attend before initiating such discussions, but they never came. That said, my school already runs a "Character Ambassadors" leadership programme, and I have earmarked students identified as autonomously motivated in this study as future candidates.

**A Positive Note**

Much of this section has focussed on addressing limitations of the present study. I would like to close by emphasising what was good about the study. First, despite being proposed many times, the lure hypothesis had not previously been subjected to empirical evaluation, perhaps owing to the normative reservations of social scientists (see *Literature Review*). The present study directly addresses this considerable gap in the literature.

Second, while randomised controlled trials (RCTs) are widely regarded as the gold standard in educational evaluation (Harrison, Arthur and Burn, 2016), there have been disconcertingly few successful RCTs in character education (Arthur *et al.*, 2014; Oldham and McLoughlin, 2024). By approximating a controlled trial structure – albeit not fully randomised – the present study offers a step towards more rigorous evaluation in the field. In fact, the study design could be readily adapted to evaluate any character education intervention, or indeed any moral education intervention premised on the idea that moral development proceeds along a heteronomy/autonomy continuum (e.g., Jubilee Centre, 2022; Kohlberg, 1981; Piaget, 1932). In principle, any such intervention could be evaluated as follows:

1. Recruit children who are extrinsically motivated to engage in an activity that manifests the target virtue, screening out autonomous children via the script;
2. "Randomly" assign participants to intervention or control groups;
3. Measure intrinsic motivation across *N* timepoints using the IMI (ideally alongside a behavioural measure);
4. Analyse data using a 2 (Group) × *N* (Time) mixed factorial ANOVA;

5. Evaluate the efficacy of the intervention: a significant Group × Time interaction would indicate that the intervention had the intended effect.

Finally, this design has another advantage over many character education studies – it is more *inclusive*. In keeping with ethical research guidelines (e.g., BERA, 2024; BPS, 2021), studies typically recruit only *voluntary* participants. But voluntary behaviours are by definition already autonomous (Ryan and Deci, 2017). This introduces a sampling bias that is problematic for two reasons: methodologically, because it risks ceiling effects; and ethically, because students with lower initial motivation – arguably those most in need of intervention – are systematically overlooked. By actively recruiting these students and using a control group to manage threats to internal validity (e.g., regression to the mean), the present design offers a more rigorous and inclusive way forward (Brown, 2025).

## Conclusion

Returning once more to the beginning, Berkowitz (2021, 2022) denounces the use of rewards in character education on the grounds that they undermine intrinsic (autonomous) motivation. However, this finding applies only to those who are already intrinsically motivated. This realisation, I argued (see *Literature Review*), creates theoretical space for claims such as Watts, Fullard and Peterson's (2021, 2022) lure hypothesis, which maintains that rewards might be used to lure initially unmotivated children into developing autonomous motivation for virtuous behaviours. Initially, I tried to offer theoretical justification for this claim on Watts, Fullard and Peterson's (2021) own terms – namely, in terms of the "internal satisfaction" of virtuous behaviours (p. 79; quoted above). I argued, specifically, that the lure hypothesis essentially asserts the contrapositive of the well-documented undermining effect of extrinsic rewards: if extrinsic rewards can prompt an *outward* motivational shift in those who start off intrinsically motivated (Ryan and Deci, 2017), then it seems reasonable to suppose that engaging in inherently valuable behaviours – those that instantiate virtue – might prompt an *inward* motivational shift in those who start off extrinsically motivated via rewards. Of course,

this argument assumes that virtuous behaviours are indeed inherently valuable, and that inherently valuable behaviours are experienced as "internally satisfying." Still, on these assumptions, the argument is valid.

Later, however, I made a misstep (see *Method*). I conflated the lure hypothesis itself with its theoretical justification, implying that the hypothesis was *equivalent to* the claim that engaging in inherently valuable virtuous behaviours can induce a shift in motivation from extrinsic to intrinsic. If results have revealed anything, it is that these two claims must be kept firmly apart. Some version of the lure hypothesis could be true – but this is not necessarily because virtuous behaviours are inherently valuable. There may be other explanations.

More explicitly, the lure hypothesis can be analysed into two distinct claims:

1. Autonomous motivation can be induced via extrinsic rewards; and
2. Engaging in virtuous behaviours in particular can facilitate this transition.

Berkowitz (2021, 2022) denies both claims, while Watts, Fullard and Peterson (2021, 2022) endorse both. However, there are more general formations of the lure hypothesis that endorse only the first claim (e.g., Benninga, 2020; Warneken and Tomasello, 2008). Results of the present study allow us to tentatively begin adjudicating among these three positions. Taken together, the two claims predict a significant Group × Time interaction across the IMI subscales. This study found no such interaction. There are several possible explanations: perhaps virtuous behaviours are not inherently satisfying, after all; or the difference between the intervention and control activities was not morally salient enough; or the study was simply underpowered. In any case, results do not support both claims in conjunction, challenging Watts, Fullard and Peterson's (2021, 2022) position. However, the study did reveal a significant main effect of Time, from *Pre* to *Post*, for the *Perceived Choice* subscale. This may be because feelings of autonomy often follow the formation of habits – in this study, the habit of weekly journaling. This finding tentatively supports the first claim, contradicting Berkowitz's (2021, 2022) position and aligning

with more general formulations of the lure hypothesis (e.g., Benninga, 2020; Warneken and Tomasello, 2008).

In the *Introduction*, I argued that character educationists face a dilemma: renounce rewards and risk alienating many schools, or embrace instrumentalism and risk diminishing the whole enterprise of character education. The lure hypothesis, I suggested, offers a possible way out of this dilemma. The present study offers tentative support for the general idea that rewards can be used to help unmotivated children develop autonomous motivation. However, serious questions remain. Most notably: what about children who are already autonomously motivated? These children must be excluded from reward contingencies in order to protect their existing motivation. But watching their less motivated peers receive rewards is likely to be perceived as unfair, which can also undermine motivation (Gubler, Larkin and Pierce, 2016). This raises deep educational questions regarding distributive justice: not only about how resources such as rewards should be allocated, but also about how allocations – especially *unequal* ones – should be discussed with students (Brown, 2024b, 2024c). Until these questions are adequately addressed, strategies such as the lure hypothesis might best be reserved for one-to-one or small-group interventions.

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## Appendices

### A: Child-Friendly Intrinsic Motivation Inventory

Name: _____ Tutor: _____

Please show how true each statement is for you by circling a number on the scale:

1. I believe that doing this activity could be valuable for me.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

2. I believe I had some choice about doing this activity.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

3. While I was doing this activity, I was thinking about how much I enjoyed it.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

4. I believe that doing this activity is useful.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

5. This activity was fun to do.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

6. I think this activity is important for my improvement.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

7. I enjoyed doing this activity very much.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

8. I really did not have a choice about doing this activity

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

9. I did this activity because I wanted to.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

10. I think this is an important activity.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

11. I felt like I was enjoying the activity while I was doing it.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

12. I thought this was a very boring activity.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

13. I felt like I had no choice but to do this activity.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

14. I thought this was a very interesting activity.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

15. I am willing to do this activity again because I think it is useful.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

16. I would describe this activity as very enjoyable.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

17. I felt like I had to do this activity.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

18. I believe doing this activity could be beneficial for me.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

19. I did this activity because I had to.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

20. I believe doing this activity could help me do better in school.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

21. While doing this activity I felt like I had a choice.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

22. I would describe this activity as very fun.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

23. I felt like it was not my own choice to do this activity.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

24. I would be willing to do this activity again because it has some value for me.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| not true at all | | | a bit true | | | very true |

**B: Gratitude Journaling Activity Sheet**

Name: _____ Tutor: _____

Think back over the past week and write down five things in your life that you are grateful or thankful for:

1. _____
   _____
   _____

2. _____
   _____
   _____

3. _____
   _____
   _____

4. _____
   _____
   _____

5. _____
   _____
   _____

**C: Generic Journaling Activity Sheet**

Name: _____ Tutor: _____

Think back over the past week and write down five things that you have done:

1. _____
   _____
   _____

2. _____
   _____
   _____

3. _____
   _____
   _____

4. _____
   _____
   _____

5. _____
   _____
   _____

**D: Intrinsic Motivation Screening Script**

[Enter tutor room. Hand a printed copy of the register/seating plan and a pen to the tutor.]

Good morning, everyone! I am Mr Brown, and I'm here this morning to talk to you about a new enrichment opportunity. The activity is *journaling*. Journaling is where you regularly write down your thoughts, feelings, and experiences. You could write about things that you have done recently or things that you are grateful for. Starting next week, journaling sessions will take place every Tuesday lunchtime for six weeks, taking us up to the end of term. Each session will last around half an hour.

Put your hand up if you think that you would like to get involved.

[…]

[Tutor], please could you put a cross next to their names.

Oh, I almost forgot to mention, each time you participate in one of these journaling sessions, you will receive 20 PRIDE Points. So, if you complete all six sessions, that's a total of 120 PRIDE Points! However, to earn any points at all, you must attend all six sessions. If you miss even one session, then no PRIDE Points. Does that make sense?

Put your hand up if you now think that would now like to get involved.

[…]

[Tutor], please could you put a tick next to their names.

If you are chosen to participate, you can stop at any time. But remember that this would mean losing the PRIDE Points.

**E: Journaling Reminder Poster (Anonymised)**



Group 1 – go to BR4

| Name | Tutor |
|---|---|
| | 7B |
| | 7B |
| | 7B |
| | 7B |
| | 7B |
| | 7B |
| | 7C |
| | 7C |
| | 7L |
| | 7L |
| | 7L |
| | 7L |
| | 7M |
| | 7M |
| | 7M |
| | 7O |
| | 7O |
| | 7O |
| | 7O |
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| | 7O |
| | 7O |
| | 7U |
| | 7U |
| | 7U |
| | 7U |
| | 7W |
| | 7W |

**Journaling enrichment!**

Tuesday lunchtime
Arrive at the start of lunch
(12:30pm)

Remember:
20 PRIDE points per session
– but only if you attend
all five sessions!

Group 2 – go to BR5

| Name | Tutor |
|---|---|
| | 7B |
| | 7B |
| | 7B |
| | 7B |
| | 7B |
| | 7C |
| | 7C |
| | 7C |
| | 7L |
| | 7L |
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| | 7M |
| | 7M |
| | 7M |
| | 7M |
| | 7O |
| | 7O |
| | 7O |
| | 7O |
| | 7O |
| | 7O |
| | 7U |
| | 7U |
| | 7U |
| | 7U |
| | 7U |
| | 7W |
| | 7W |
| | 7W |
| | 7W |

**F: Study Timeline**

| | |
|---|---|
| W/b 24/02/2025 | Participant recruitment over three mornings; parental activity letters distributed. |
| 04/03/2025 | First journaling session (room mix-up). |
| 11/03/2025 | Second journaling session; baseline (pre-test) data collection. |
| 18/03/2025 | Third journaling session. |
| 25/03/2025 | Fourth journaling session. |
| 01/04/2025 | Fifth journaling session. |
| 08/04/2025 | Sixth and final journaling session; post-test data collection. |
| 28/04/2025 | Follow-up data collection; study debriefing; student assent forms; parental consent letters distributed. |
| 06/05/2025 | First journaling session for students excluded from study. |
| | … |
| 08/07/2025 | Final journaling session for students excluded from study. |

**G: Gatekeeper Consent**

**H: Parental Activity Letter**

Mr Brown
brown.j@barrshill.coventry.sch.uk
24th February 2025

Dear Parent/Guardian,

I hope this letter finds you well. I am writing to inform you about an upcoming opportunity for students at Barr's Hill School. As part of an enrichment program, we will be offering students the chance to participate in two engaging journaling activities designed to promote personal growth and character development.

**Overview of the Activities**
Starting in March, your child will have the opportunity to participate in a reflective journaling programme over six weeks. These sessions are designed to encourage personal growth, self-expression, and positive habits of reflection. The programme includes two types of reflective journaling activities, which will focus on exploring thoughts and feelings through writing exercises.

The activities will take place on Tuesday lunchtime for approximately half an hour. Students who complete all six sessions will earn PRIDE Points as a reward for their participation.

**Participation Details**
Participation in these activities is entirely voluntary. However, to receive PRIDE Points, students must attend all six sessions. Missing a session or withdrawing from the programme will result in the forfeiture of the reward.

While the activities are designed to be enjoyable and beneficial, students are welcome to withdraw at any time should they choose.

In addition to enhancing their journaling skills, this programme provides a unique opportunity for students to engage with their peers and reflect on their experiences in a supportive environment.

**Next Steps**
If you have any questions or would like to discuss this further, please do not hesitate to reach out to me at brown.j@barrshill.coventry.sch.uk. Your support in encouraging your child's participation in this enrichment opportunity is greatly appreciated.

Thank you for your time.

Warm regards,

Mr Brown
Super-Curricular Lead

**I: Student Assent Form**

**Title of the Study: Can intrinsic motivation be induced via extrinsic rewards?**

**Hello!**

We are happy that you participated in the journaling activities at Barr's Hill School! This form is to let you know more about what you did and to ask if it's okay to use your answers for our research.

**What Was the Study About?**

You took part in two types of journaling activities: gratitude journaling and generic journaling. The goal of this study was to see how these activities might help you feel more motivated and how they might help you in other areas of your life.

**What Will Happen to My Answers?**

- Your answers will be kept secret. This means we won't use your name or any other personal information when we look at the data.
- We will only share the results with your teachers and people involved in the study, but they will not know who you are.

**Can I Say No?**

- You can choose not to let us use your answers. If you say no, it won't affect your relationship with your teachers or any rewards you earned.
- If you want to change your mind later, you can tell your teacher, and we will remove your answers.

**Your Choice**

By signing below, you are saying that you understand what the study was about and that you agree to let us use your answers.

**Please write your name below:**

**Your Name:** _____

**Date:** _____

**Your Signature:** _____

**Thank you for your help! If you have any questions, feel free to ask your teacher or me.**

**J: Parental Consent Letter**

Mr Brown
brown.j@barrshill.coventry.sch.uk
28th April 2025

Dear Parent/Guardian,

I hope this letter finds you well. I am writing to share information about a research study that your child participated in at Barr's Hill School as part of my MA in Character Education.

**Study Overview**
The purpose of this study was to explore the role of extrinsic rewards in fostering intrinsic motivation among students. Specifically, we engaged students in two journaling activities: gratitude journaling and generic journaling. The aim was to understand how these activities might influence students' motivation and overall well-being.

**Your Child's Participation**
Your child participated in a series of sessions over six weeks, where they completed these journaling activities and provided feedback through self-report questionnaires. We believe that the insights gained from this research will contribute to our understanding of effective character education practices.

**Data Use and Confidentiality**
I want to assure you that all data collected during this study is treated with the utmost confidentiality. The information is completely anonymous, meaning that no identifying details will be associated with your child's responses.

**Opt-Out Option**
As a parent or guardian, you have the right to opt out of your child's data being included in the research findings. If you prefer that your child's data not be used in this study, please inform me by 12th May 2025, and I will ensure that your child's information is excluded from any reports or publications. Please rest assured that opting out will not result in forfeiting any rewards, as your child will have already completed all six weeks and earned the associated PRIDE Points. The decision to opt out will not affect your child’s relationship with the school or their ability to earn rewards in other contexts.

**Further Information**
If you have any questions about the study or your child’s involvement, please do not hesitate to contact me at brown.j@barrshill.coventry.sch.uk. Your support and collaboration in this important research are greatly appreciated.

Thank you for your time and consideration.

Warm regards,

Mr Brown
Super-Curricular Lead
Barr's Hill School