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Prosocial behaviourial spillover and nudging: A longitudinal quasi-experimental study on the moderating role of altruistic motives

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ABSTRACT

This study investigates the extent to which prosocial nudging is instrumental in fostering spillover effects of prosocial behaviours among young adults. Also, it examines how the interplay of prosocial behavioural spillover and altruistic motives is shaped in a nudged environment. A longitudinal quasi-experimental study was conducted to test the hypothesized effects of prosocial nudging on young adults. The subjects were 104 postgraduate students from a higher education institute in India who had donated blood recently. A pretest-posttest design was adopted to test the effect of experimental interventions implemented on a university campus. The experimental data was analysed using hierarchical regression models. The results offer insights into the design of prosocial nudging mechanisms supporting behavioural spillover from easy to difficult prosocial behaviour among young adults. The findings also demonstrate how nudging enables the transition of pseudo- to pure altruistic motives.

1. Introduction

As students at business schools and young adult professionals start performing managerial roles, their prosocial values and predisposition for prosocial behaviour are emerging as the decisive factor for organizations' socially responsible behaviour (Alfirević et al., 2021; Kadic-Maglajlic et al., 2019; Pek et al., 2023). Prosocial behaviour is an individual's voluntary and intentional behaviour to extend benefit to another person (Esteve et al., 2016). Young adults demonstrating prosocial behaviour are cooperative, helping, and empathetic in the workplace which in turn positively impacts the organization's performance (Shao et al., 2017; Sun et al., 2007). Prosocial young professionals contribute significantly to the overall growth and stability of the organization by fostering intergroup coordination, enhancing co-worker's productivity, and enabling the organization to effectively perform social responsibility. These behaviours not only drive an organization's performance but also are instrumental in accelerating a nation's economic and social growth (Alfirević et al., 2023; Muethel et al., 2011). The extant literature consistently maintains that prosocial behaviour is a key element of both, organizational citizenship behaviour and interpersonal citizenship behaviour (Dalal, 2005). Empirical evidence suggests that prosocial behaviour counteracts detrimental conduct at the workplace such as bullying and absenteeism (Garg & Sharma, 2023; Raskauskas et al., 2010). Understanding young adults' prosocial behaviour mechanisms is important because they are the largest cohort of the society accounting for about 32 % of the global population of the total workforce (Spitznagel, 2020). A clearer and deeper understanding of prosocial behavioural spillover mechanisms and the role of prosocial nudging in this phenomenon can help organizations, social enterprises, and not-for-profit and public welfare organizations promote prosocial and helping behaviour among their largest stakeholders i.e. cohort of young adults.

Accordingly, it is not surprising that in the arena of business management research, scholars have shown keen interest in examining young adults' prosocial behaviour and the mechanisms to motivate and promote these behaviours (e.g., Iweala et al., 2019; Ruehle, 2023; Shin & Kim, 2018). However, scholarly works suggest that while behaviour change is a quite complex process (Whitmarsh, 2009), maintaining consistency in prosocial behaviour although poses greater difficulties, is doable through directed efforts (Mullen & Monin, 2016). A promising approach for encouraging prosocial young adults to demonstrate moral consistency in the future is through the utilization of the behaviour spillover effects, where an individual's enactment of a prosocial behaviour increases the likelihood of his/her engagement in prosocial behaviour subsequently (Ghesla et al., 2019). A growing body of literature has documented spillover between similar behaviour (spillover between pro-environmental behaviour; Lanzini & Thøgersen, 2014) and also dissimilar prosocial behaviour (spillover between dissimilar

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charitable alternatives; Ek, 2016; Larue et al., 2022).

Despite rich empirical literature on behaviour spillover effects, there are three aspects which got relatively less scholarly attention and need more empirical explanations. First, most empirical investigations in the recent past focused on pro-environmental and sustainable consumption (e.g., Ye et al., 2022; Iweala et al., 2019; Nilsson et al., 2017), and some other prosocial behaviour categories such as helping, donating and empathetic behaviour for the needy got less attention (Alt & Gallier, 2022). Second, there is a limited understanding of the motivation mechanisms of prosocial behaviour. This enquiry is important as the motivation behind an action is a key determinant of behavioural intention to continue with the behaviour under inquiry. Prosocial behaviours are reported to be motivated by broadly two types of motives viz. pure altruistic motives (pure altruism) where an individual is motivated by concerns for another and desire to benefit the needy without any expectation of gain for the self; and impure altruistic motives (egoism or pseudo-altruism) where prosocial behaviour is motivated by self-interest in addition to concerns for another (Bowles & Gintis, 2011). It is important to note that altruism combines behavioural and motivational elements. An empirical investigation of prosocial behaviour which captures altruistic motives (both pure and pseudo-altruistic) and, examines the interplay between spillover effects and altruistic motives can suitably explain how motivational complementarities drive spillover from easy to difficult prosocial behaviour. Third, we do not enough about how behaviour spillover from easy prosocial behaviours to difficult prosocial behaviour can be encouraged (Wang et al., 2021; Lauren et al., 2019). Prosocial behaviour literature suggests that one of the most effective ways to promote desired behavioural changes is nudging. Numerous previous studies investigated the impact of prosocial nudges in different contexts and provided empirical evidence to support this claim (e.g., Ghesla et al., 2020; Kuhfuss et al., 2016). However, the extent to which prosocial nudging can successfully foster spillover effects in prosocial behaviour is uncertain, akin to its efficacy in an individual's behaviour change. Additionally, it will be useful to know how the interplay of prosocial behaviourial spillover and altruistic motives is affected in a nudged environment.

The current study aims to address the three research questions explained above. In particular, this experiment study examines the prosocial behaviour of young adults who have the propensity to demonstrate helping and donating behaviour to capture behavioural spillover from easy prosocial behaviour (such as; blood donation) to behavioural intention to adopt difficult prosocial behaviour (such as; organ donation) and record both pure-altruistic motive and pseudo-altruistic motives of the participants, to examine the effectiveness of prosocial nudging in driving prosocial behaviour spillover and its impact on participants' altruistic motives, and to study the moderating effect of pure and pseudo-altruistic motives on prosocial behaviourial spillover in a nudged environment. This study employed a longitudinal quasi-experimental design to test the hypothesized effects of prosocial nudging on young adults. The experiment subjects were 104 post-graduate students from higher education institutes in India who had donated blood lately. A pretest-posttest design was adopted to test the effect of experimental interventions implemented on campus to stimulate difficult prosocial behaviourial intentions among subjects. The experimental data was analysed statistically using independent sample *t*-tests and hierarchical regression models.

The remaining sections of the paper are organized as follows: First, we explain the theoretical and conceptual background, and major contributions of the study followed by the conceptual model and hypotheses development. Research methodology including details of experiment settings, interventions, participants' profiles, and analytical tools are explained in the subsequent section. Next, we present results followed by a detailed discussion and implications of the major findings of this investigation. We summarise the findings and limitations of this study in the last section.

2. Conceptual and theoretical background

2.1. Prosocial behaviour, altruism and young adults

Prosocial behaviour refers to an individual's behaviour primarily motivated by the concern for others' wellbeing. Behaviours directed towards sharing, caring, helping, and volunteering to *extend benefit to another are included in the category of prosocial behaviour which is at the core of human social behaviour (*Gupta & *Thapliyal*, 2015). It is important to note here that helping behaviour motivated by professional obligations falls outside the domain of prosocial behaviour. However, supporting an organization whose agenda is to promote the well-being of the needy is considered prosocial behaviour. Here prosocial person uses organizations such as the Red Cross Society to increase the efficiency of the help he/she intends to extend to the needy (Bierhoff, 2005). Nevertheless, the extant literature reports that the motivation behind prosocial behaviour may not solely be the welling of another. Based on the net cost of prosocial behaviour for the self, motivation for prosocial behaviour can be broadly classified into altruism and mutualism (pseudo-altruism) (Minami et al., 2021). Where an individual extends the benefit to another even at the net cost to self with the sole goal of the wellbeing of another, he/she is motivated by pure altruism. On the other hand, individuals motivated by pseudo-altruism (mutualism) commit prosocial behaviour for the benefit of the other and also for self (Bowles & Gintis, 2011). Thus, while altruism motivates individuals for prosocial behaviour aiming to benefit another, prosocial behaviour motivated by pseudo-altruism is primarily aimed at gaining for self, besides the concerns for the wellbeing of the another (Piliavin & Charng, 1990). Scholarly investigations consistently maintained that individuals' motivations for engaging in prosocial behaviour typically encompass a mix of pure-altruism and pseudo-altruism (Esteve et al., 2016; Tullberg, 2004). In this study, prosocial behaviour is conceptualized as an individual's behaviour to promote the well-being of another (Lan & Wang, 2020). While the definition of prosocial behaviour is purely behaviourial, in this study we combine behaviour and motivation elements.

Further, scholarly investigations adopted two main approaches for examining prosocial behaviour, direct assessment, and indirect assessment through measuring behavioural intentions (Baumsteiger & Siege, 2018). Although there are significant merits of direct assessment (Crano et al., 2014); due to contextual limitations, numerous empirical investigations studied prosocial behaviour indirectly by recording the prosocial intention of the individuals (Baumsteiger, 2019). Prosocial intention reflects an individual's willingness and readiness to help another (Agerström & Björklund, 2009). The theory of planned behaviour strongly supports this approach which is one of the most frequently applied theories to study people's behaviour in each context (Marta et al., 2014). It suggests that behavioural intentions are direct and strong predictors of actual behaviour and therefore intention can be used as a proxy for actual behaviour (Ajzen, 1991; Baumsteiger & Siegel, 2019). Many previous prosocial behaviour studies followed this approach to examine and predict an individual's prosocial behaviour in different contexts such as CSR co-creation (Zhou et al., 2024), and helping behaviour (Baumsteiger & Siegel, 2019). Following the approach suggested by previous prosocial behaviour works, this study adopted the indirect assessment approach to examine the prosocial behaviour of young adults by measuring their prosocial intention.

In this study, young adults are individuals born in the mid-1990s and raised in the 2000s (Cohen, 2022). According to generational cohort theory shared experiences have a significant influence on collective values and goals of peer groups belonging to a generation. The generational cohorts' experiences are formative and provide identity to a generation. The identities of the generation cohorts have long-lasting effects on the individual's attitude, perceptions, and behaviours (Goldring & Azab, 2021). Recent studies suggest that young adults' identities are influenced by collective experiences of some noteworthy incidents and developments such as the 2008 financial crisis, increasing

acceptance for diversity and inclusion of socially excluded groups such as LGBTQs, climate change, platform economy and most recent COVID-19 pandemic (Pichler et al., 2021; Turner, 2015). Relying on the assertions of generational cohort theory, we believe that the collective experience of the above-mentioned events played an instrumental role in shaping their prosocial behaviours. Recent studies on young adults and Millennials support the viewpoint that their prosocial behaviourial mechanisms and motives are quite different from those of Millennials and other previous generations (e.g. Demarque et al., 2015; Rani & Samuel, 2019). Graça and Zwick (2021) concluded that Millennials are primarily motivated by what is in it for them in prosocial action. They look for personal achievements such as public recognition, and reputation enhancement from a prosocial action. Thus, usually primary motives behind the prosocial behaviours of Millennials are pseudo-altruistic (Ye et al., 2022). On the other hand, young cohorts are found to be more generous and concerned for others (Mendini et al., 2022). Results of empirical investigations indicate that young adults show sincere concern for societal issues and prefer to purchase from firms which were perceived to be socially responsible (Hoffmann et al., 2018). Given the differences in characteristics and collective experiences of young adults and Millennials, the prosocial behaviourial mechanisms of one might not be the same for the other.

2.2. Behaviourial spillover from easy to difficult prosocial behaviour

The extant literature suggests that one of the most effective methods to promote desired behaviourial change is through utilizing the spillover effect where an individual's engagement in a prosocial activity increases the likelihood of their engagement in other prosocial activities (Lanzini & Thøgersen, 2014; Li, 2021). In this study, we referred to spillover theory to examine the effect of positive spillover of easy prosocial behaviour on young adults' behavioural intention to engage in difficult prosocial behaviours. The theory suggests that "orderly and pleasant" behaviourial experience recapitulates and promotes positive and productive subsequent behaviours (Nilsson et al., 2017). It thus explains the spillover effect of one behaviour on a behaviour that happens after the first behaviour (Dolan et al., 2015). From the perspective of the current study, the impact of young adults' easy prosocial behaviour on willingness to engage in difficult prosocial behaviour in the future is defined as the prosocial behaviourial spillover effect.

Several previous studies on prosocial and pro-environmental behaviours based their works on spillover theory to study how human behaviour affects subsequent behaviour and how it can be used to motivate desired behaviourial changes (Nilsson et al., 2017). This phenomenon is called behaviourial spillover. It captures the extent to which an individual's engagement in one behaviour determines the likelihood of following behaviour (Nilsson et al., 2017). It is interesting to note that previous investigations suggest that the impact of a specific human behaviour on a subsequent behaviour can be both promoting (positive) (Lee & Brudney, 2015) or inhibiting (negative) (Schmitz, 2019). In the current study, spillover is conceptualized as occurring when past easy prosocial behaviour fosters the intention to engage in difficult prosocial behaviours in the future. Thus, this experimental study captured a positive spillover effect where past prosocial behaviours are expected to promote willingness to engage in other prosocial behaviours. There is empirical evidence suggesting that spillover occurs between similar behaviours. For instance, Thøgersen and Ölander (2003) found that pro-environmental behaviour such as recycling behaviour impacted plastic package reduction. At the same time, previous studies supported the occurrence of spillover between dissimilar behaviours, such as, recycling behaviour impacting behaviourial intention to purchase organic products. The current experimental study examined the behaviourial spillover between similar behaviours i.e. easy prosocial behaviour and difficult prosocial behaviour where an individual's altruistic motives (pre and pseudo) create a pathway for the spillover occurrence.

2.3. Contribution of the study

Although previous scholarly investigations offer useful insights into behaviourial spillover in various contexts such as sustainable consumption (Kadic-Maglajlic et al., 2019), skills and values spillover (Edwards & Rothbard, 2000), there are not enough studies focusing on prosocial behaviourial spillover mechanisms (Lauren et al., 2016; Wang et al., 2021). Moreover, there is a need to study how prosocial behaviourial spillover can be encouraged and how altruistic motives moderate pathways to spillover occurrences. Finding ways to strengthen individuals' altruistic motives and facilitate prosocial behaviour spillover for the well-being of global societies is more crucial than ever at a time when societies worldwide are facing critical challenges of resource scarcity, and social inequalities (Gupta et al., 2020). Among the most effective mechanisms are nudges which are found to be easy and cost-effective tools to promote desired behaviour. Nudging for desired behaviour spillover has been the key area of scholarly interest because it can bring the desired change in an individual's behaviour without affecting one's action space and economic motivations (Ghesla et al., 2019). Despite ample empirical evidence supporting the significant impact of nudging on desired behaviour, studies on nudge-induced prosocial spillover are limited in scope and numbers. A deeper and clearer understanding of spillover mechanisms and interventions facilitating them is necessary if spillover is to be targeted as a behaviourial change approach in young adults. In line with these requirements, the current experiment makes the following two contributions; first, this study explores the impact of prosocial nudging on the above-mentioned behaviourial spillover mechanisms. Second, this experiment examines how altruistic motives could be another pathway to encourage prosocial behaviourial spillover from easy to difficult prosocial behaviours (pure altruistic motives, reputation motives and kinship).

3. Conceptual model and hypotheses development

3.1. Prosocial nudging and positive spillover from easy to difficult prosocial behaviour

Literature offers numerous scholarly investigations on instruments used to induce desirable behaviour among individuals. These studies tested a variety of tools ranging from traditional policy tools such as incentives for desirable behaviour, penalty provisions for violations etc. to softer, more economical yet effective instruments such as nudges (Oliver, 2015). Scholars argue that while traditional policy tools account for direct impact, nudges not only bring direct impact on targeted behaviours, but also are instrumental in positive spillover on similar and other behaviours (d'Adda et al., 2017). Nudges refer to indirect ways of influencing an individual's behaviour without restricting their freedom of choice (Saetra, 2019). In a nudged environment, subtle cues are used to encourage individuals towards taking desired actions or making desired choices. While nudges guide individual's choices or behaviours, individuals are free to make their decisions (Nguyen et al., 2024). Extant literature suggests that nudges are frequently used to promote desired behaviourial change. Several studies on prosocial behaviour such as charitable giving, environment protection, organ and blood donation, and medical crowdfunding uniformly asserted that prosocial nudges are effective tools to promote individual's prosocial behaviours (Le et al., 2023; Ghesla et al., 2020; Kuhfuss et al., 2016).

Behaviourial spillover studies have widely applied the concept of nudging to examine how behaviourial interventions (nudges) impact spillover occurrences in different contextual settings (Donkers et al., 2017; Jessoe et al., 2021). For instance, in a recent study, Kurz (2018) found that when vegetarian items were provided at the top of the menu the sales of vegetarian food increased. Sales increase remained unaffected even when the vegetarian items were moved back to their original position on the menu. The author explained that consistent increases in the sales indicated behaviourial change i.e., habit-forming for the

vegetarian food resulting from the nudge. Another study by Capraro et al. (2019) provided empirical evidence supporting nudge-induced behaviourial spillover. They showed how behaviourial nudging encouraged the participants of a dictator game to donate more to their fellow participants. The behaviourial change persisted in the subsequent similar higher-stake charity decisions even when nudges were not used. Another recent study conducted by d'Adda et al. (2017) investigated the impact of traditional policy interventions like monetary incentives and regulations and pro-environmental nudges on an individual's pro-environmental behaviour. Like other nudging experiments, this study also concentrated on pro-environmental behaviours. Thus, previous nudge-induced studies predominantly focused on pro-environmental behaviour (e.g., Truelove et al., 2014; Nilsson et al., 2017. There is a dearth of prosocial studies concentrating on other public welfare behaviours such as helping and donation behaviour. Additionally, due to a mixed sample, previous studies fail to explain peculiar aspects of young adults' prosocial behaviourial spillover in a nudged setting. Building upon previous works this experiment study aims to capture the impact of prosocial nudging on young adults' helping behaviour spillover mechanisms routed through individual's altruistic motives. We propose,

H1. Prosocial nudging influences the positive spillover from easy prosocial behaviour to behaviourial intention to adopt difficult prosocial behaviour.

3.2. Altruistic motives and prosocial nudging

Scholars argue that a clear and in-depth understanding of motives for prosocial behaviour is essential to ensure the continuance of desired behaviour in the future. Thus, to facilitate positive spillover from easy to difficult prosocial behaviour, it is inevitable to understand the motive mechanisms working behind an individual's prosocial behaviour. Extant literature suggests that altruism represents the ultimate motivation or goal of the individual demonstrating prosocial behaviour (Hatfield et al., 2013). Altruism is described as the prosocial behaviour carried out solely to extend the benefit to the other rather than for the self-benefit (Rushton, 1982). However, this definition is based on the behaviourial approach to define altruism which disregards the motivation behind the prosocial behaviour. In this study, we followed the motivation approach to define altruism as the extant literature suggests that pure altruism (benefit the other sometimes at the cost of self) may not always be the primary motivation for helping behaviour. Rather it might be to gain something for the self in the form of social approval or reduce one's distress resulting from witnessing other's sufferings, which is termed pseudo-altruism (Bowles & Gintis, 2011). Thus, the ultimate goal of prosocial behaviour may be others' well-being or gain for self or might as well be a mix of both, pure altruism and pseudo-altruism (Esteve et al., 2016). The motivational approach of altruism will thus explain how and why prosocial behaviour are performed and, how the motives behind them affect the spillover of prosocial behaviours. In this study, besides pure altruism, two subcategories of pseudo-altruism were considered: reputation and kinship. Previous prosocial studies have frequently reported that these two pseudo-altruism motives significantly influence the prosocial behaviour spillover (Hodor, 2021; Peng & Lee, 2019). Reputation motives operate through reciprocity with an expectation of gain for the self in the form of social recognition for prosocial behaviour (Inoue et al., 2023). On the other hand, kinship motives reflect the helper's concerns and preferences for the family, friends, and relatives. The helper motivated by kinship operates through indirect reciprocity. Individuals motivated by kinship are more likely to demonstrate prosocial behaviour if they believe that the help extended to others is reciprocated in favour of their loved one when would need it (Maner & Gailliot, 2007). Scholars argue that positive outcomes should not be favoured over positive motives for prosocial behaviour as prudential motives within a given context have significant and long-term impacts on an individual's behaviour in the future (Hobbs, 2017). This viewpoint emphasizes the need to explore how altruistic motives behind prosocial behaviour can be reinforced to strengthen the behaviourial intention to indulge in prosocial behaviour in the future.

Previous research suggests that prosocial nudging is an effective tool to influence an individual's altruistic motives for prosocial behaviour (Ghesla et al., 2020; Kuhfuss et al., 2016). For altruistically disposed individuals, increased availability of information about the opportunities for altruistic acts increases the likelihood that the cause highlighted through prosocial nudging receives their attention. These mechanisms suggest that a social problem being cautiously available to the agent (the individual demonstrating easy prosocial behaviour) increases the chance of an action by the agent to address the social problem (Shin & Kim, 2018). Thus, prosocial nudging can positively reinforce individuals' pure altruistic motives as they have the potential to stimulate further conviction for the well-being of others. Empirical studies support this postulation. For instance, Capraro et al. (2019) in their experiment study concluded that moral nudges had a significant positive impact on the altruistic motives of participants. The authors confirmed that the impact of nudges was not limited to the choice made immediately after the experiment but persisted to the second study. These findings validate the argument that prosocial nudging has the potential to strengthen pure altruistic motives which are reflected in their future difficult prosocial behaviours. The literature also supports that prosocial nudging may cause individuals to reflect on their pseudo-altruistic motives for prosocial behaviour. Scholars suggest that nudges impact the reputation-building motives of individuals by reflecting on why prosocial behaviour like donation is socially valued (Hobbs, 2017). Nudges may reflect on corresponding normative beliefs and thus provide an additional incentive for pseudo-altruistic motives. This is supported by scholarly work by Campbell-Arvai et al. (2014) on social norms and psychology conducted in the recent past. The authors suggest that ‘injunctive norms – what people ought to do – … can be overwhelmed by descriptive norms – what people are doing’. Thus, there are sufficient arguments in the extant literature to believe that prosocial nudging will impact altruistic motives (both, pure and pseudo) for prosocial behaviour. Hence, we propose,

H2a. Prosocial nudging influences altruism (pure altruistic motive) for prosocial behaviour.

H2b. Prosocial nudging influences reputation motive (pseudo-altruistic motive) for prosocial behaviour.

H2c. Prosocial nudging influences kinship motive (pseudo-altruistic motive) for prosocial behaviour.

3.3. Moderating role of altruistic motives

An important dimension of prosocial behaviour spillover that received limited scholarly attention is how altruism which reflects the helper's ultimate motivation (pure and pseudo) affects the positive spillover between prosocial behaviours (Ghesla et al., 2019; Truelove et al., 2014). This study will take the research a step further and examine the moderating role of pure- and pseudo-altruistic motives for prosocial spillover behaviour on the spillover mechanism. The positive theory indicates that individuals with pure-altruistic motives experience a higher degree of positive transfer of similar and dissimilar prosocial behaviour than individuals who are motivated by pseudo-altruistic motives such as reputation and kinship (Laury & Taylor, 2008) for the following two reasons. First, previous studies have constantly maintained that prosocial behaviour motivated by pure altruism has reinforcing properties; it makes the helper feel satisfied and experience self-gratification (Baumann et al., 1981; Wildman & Hollingsworth, 2009). Due to the reinforceable properties of these feelings, the helper experiences positive affect transfer resulting in a spillover of prosocial behaviour. Thus, individuals having pure altruistic motives for prosocial behaviour are highly likely to demonstrate prosocial behaviour across

different domains of life in the future. On the other hand, pseudo-altruistic motives for prosocial behaviour (reputations and kinship) lack reinforcing properties (Feigin et al., 2014) and thus, may not facilitate a positive spillover of prosocial behaviour (i.e. easy prosocial behaviour to difficult prosocial behaviour in the current context). Second, a growing body of literature suggests that prosocial behaviour having pure altruistic motives results from empathy, a conviction in caring and/or justice for the needy (Bar-Tal, 1982; Gejdoš & Kováčik, 2020). Self-satisfaction gained from prosocial behaviour (like helping the needy), further strengthens the conviction for other's wellbeing. This reinforcement facilitates positive spillover from easy prosocial behaviour to difficult prosocial behaviour. Unlike pure-altruistic motives, pseudo-altruistic motives such as reputation and kinship primarily operate through reciprocity and thus, the outcome of the prosocial behaviour in the form of benefits for the self is the main driving force (Malmendier et al., 2014). For instance, an individual motivated by kinship would demonstrate helping behaviour when someone in a close social group needs help. Thus, benefit to the self or close social group member becomes a precondition for the spillover from easy to difficult prosocial behaviour (Bénabou & Tirole, 2006). One can argue that pseudo-altruistic motives may inhibit spillover from easy to difficult prosocial behaviour. In light of scholarly arguments, we propose,

H3a. Altruism (pure altruistic motive) impacted by prosocial nudging moderates the positive spillover from easy prosocial behaviour to behaviourial intention to adopt difficult prosocial behaviour.

H3b. Reputational motive (pseudo-altruistic motive) impacted by prosocial nudging moderates positive spillover from easy prosocial behaviour to behaviourial intention to adopt difficult prosocial behaviour.

H3c. Kinship motive (pseudo-altruistic motive) impacted by prosocial nudging moderates positive spillover from easy prosocial behaviour to behaviourial intention to adopt difficult prosocial behaviour.

Fig. 1 shows the research model.

4. Methods

4.1. Experiment design and procedures

A longitudinal quasi-experiment design is adopted to test the hypothesized causal impact of nudging interventions on prosocial behaviour intentions. Contrary to pure experiments, the quasi-experiment design is appropriate for real-world or natural settings where the researcher has less control over the random assignment of participants to experimental conditions owing to ethical or practical considerations (Plonsky, 2017; Cook & Wong, 2008; Campbell & Stanley, 1963; Shadish et al., 2002). This design is widely employed for longitudinal research in the psychology, education, and social science fields where it is challenging to maintain control over experimental variables across an extended period (Bloom et al., 2005). For this study, the pretest-posttest design (Creswell & Plano Clark, 2018) is employed to evaluate the effect of nudging interventions designed and implemented to promote prosocial behaviour. The ethical considerations of nudging interventions are addressed by following ethical guidelines for nudge design recommended by Meske and Amojo (2020). These guidelines are related to the clarity on the nudge target group, the purpose of the nudge, obtaining informed consent from participants and ensuring participant autonomy and uniformity. A description of aspects of the experiment procedure viz. nudge context & interventions, subjects, measures, and data collection and analysis is presented in the following subsections.

4.2. Nudge context and participants

The participants in this experimental study were young adults recruited during a blood donation campaign at the campus of a higher education institute located in the national capital region of India. India has a well-established and diverse business education landscape comprising both public and private institutes offering management programs (Thakur & Babu, 2017). In recent years, business curricula have increasingly emphasized corporate social responsibility, environmental sustainability and ethical leadership concepts (Jose, 2016). Additionally, the cultural framework of the country is deeply rooted in collectivist values, where community engagement and altruistic behaviours are encouraged (Sinha et al., 2001). However, despite these cultural values, the blood donation rate in the country remains lower than in Western nations, largely due to misconceptions and a lack of awareness (Patel et al., 2024). This highlights the need for behavioural interventions such as nudging, to encourage greater participation in prosocial behaviours.

The selected institute was among the top higher education institutes specializing in masters-level business studies accredited by AACSB and AMBA[1] and part of the PRME[2] community. There was a strong impetus to cultivating ethical and socially responsible behaviours among students across all programs. The real-life experimental setting for the study was a blood donation drive organized by one of the student clubs engaged in coordinating social initiatives at the campus. The club planned and conducted a variety of social projects related to community services, sustainability awareness workshops and guest speaker series on social responsibility that spans the academic year viz. August to June. The drive was organized in association with the Indian Red Cross Society[3] in August 2022 as the first club event for the academic year. The selection of the experiment setting was based on the access to the vast population of young adult participants owing to the author's association with the institute. Further, young adults are a widely preferred target group for nudging experiments (e.g. healthy eating, sustainable flight choices, energy conservation among others) for stimulating sustainable behaviours in past studies (Demarque et al., 2015). A total of 170 students who donated blood during the blood donation drive were recruited for the study. All the students were informed about the purpose of the study and the voluntary nature of their participation. No student identity was gathered, informed consent was undertaken, and anonymity was verified following the ethical guidelines for nudging recommended by Meske and Amojo (2020).

4.3. Prosocial nudging and timelines

The primary aim of this study was to examine the effectiveness of prosocial nudging interventions towards a positive spillover effect of easy prosocial behaviour to intentions for difficult prosocial behaviour intentions. These interventions were developed as part of the student club event calendar through an iterative process between members of a student club, the institute administration, and the research team. The on-campus implementation of these interventions spanned the first two terms (over 6 months) of the academic year viz. August 2022 to June 2023. While the club events were open to students across all programs, the participation of study subjects viz. 170 young blood donors were ensured through follow-ups and reminders. A description of some of the nudging interventions used for experimental manipulation is presented below:

4.3.1. Nuding intervention 1: awareness session on voluntary blood stem cell donation

The focus of the session was to sensitize young participants about the

[1] The Association to Advance Collegiate Schools of Business (AACSB) and The Association of MBAs (AMBA) are global accreditation bodies for higher education.

[2] United Nations' Principles of Responsible Management Education.

[3] A voluntary society which is part of International Red Cross and Red Crescent Movement.

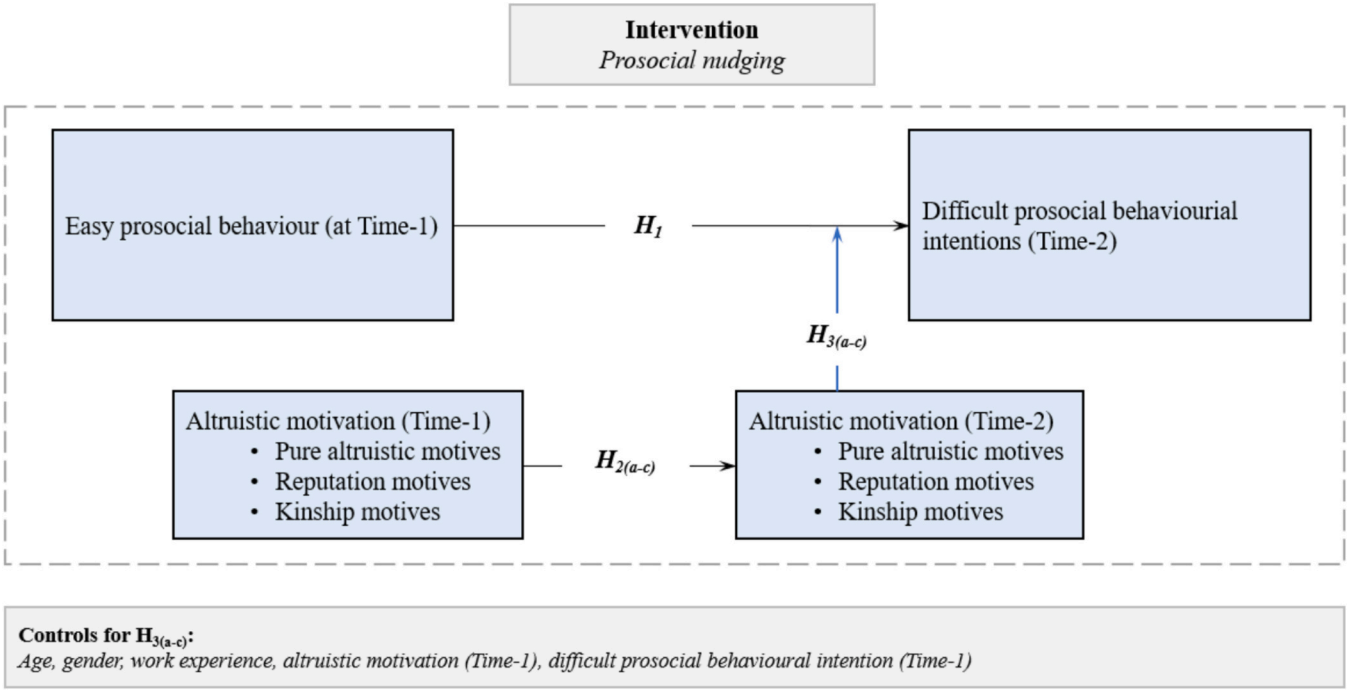

Fig. 1. Conceptual model.

growing need for blood stem cell donors. During the session, the speaker explained the role of blood stem cells in treating blood-related disorders like blood cancer, the stem cell donation process, donor eligibility, potential risks/side effects and the registration process for potential donors. The session was delivered by a not-for-profit organization working to create blood cancer awareness and potential treatments and transplants for cancer patients. This 90-minute classroom session was organized in October 2022 and attended by 130 blood donors recruited for our study.

4.3.2. Nuding intervention 2: street play on organ donation awareness

In association with the cultural club of the Institute, a street play was organized on the theme "Gift of Life". The characters in the play highlighted how one can gift life to another by donating organs. The play clarified some common misconceptions and myths about organ donation. They also provided information on becoming an organ donor. The street play was organized in December 2022 at the campus amphitheatre and attended by over 400 students including 132 study subjects.

4.3.3. Nuding intervention 3: poster campaign

A poster campaign on the theme of "Give for good" was organized in January 2023. The campaign received several submissions with messages to promote donations for social causes among young adults with special emphasis on issues such as helping the elderly people, donation for old age homes, and organ donation. These posters were exhibited in the display area of all the academic buildings, social spaces, and student hostels on the campus. Some of the materials used for these nudging interventions are presented in Annexure A.

4.4. Measures and data collection

For testing the hypothesized relationships (Fig. 1), responses were collected for three latent constructs viz. easy prosocial behaviours, difficult prosocial behaviours and altruistic motives. The construct of prosocial behaviours is defined as acts of kindness and cooperation intended to benefit others (Esteve et al., 2016). In this study, easy prosocial behaviour is conceptualized as prosocial behaviour that participants were regularly engaged in the past (e.g., blood donation in the current context) and the willingness to adopt the behaviours that were not engaged in the past as difficult prosocial behaviourial intention (e.g., behaviourial intention to donate organs in the current context) (Lauren et al., 2016). Easy prosocial behaviour is measured using four items (e.g. *I offer seats to elderly passengers in public transport*; *I volunteer to participate in a medical camp*). The difficult prosocial behaviourial intentions are expressed as individuals' intention to be involved in acts of personal sacrifice for the greater good of society; and are measured using three items (e.g. *I would like to register with hospitals and blood banks as a regular blood donor who can be contacted when need arises; I would like to be an organ donor to a stranger after I die)* (Baumsteiger & Siegel, 2019; Lauren et al., 2016). Participant's altruistic motives were measured as a second-order construct with three dimensions viz. pure altruistic motives, reputational motives and kinship motives following the recommendation of Capraro et al. (2019) and Hobbs (2017). All items were measured on a 5-point Likert scale ranging from 1: strongly disagree and 5: strongly agree. Since the scales for all three latent constructs were adapted for the context of this study, exploratory factor analysis (EFA) using Principal Component Analysis (PCA) using pilot data was performed to establish construct reliability and validity (Hair et al., 2010). Additional items were used to collect participants' attributes such as age, gender, and work experience which may impact their prosocial behaviour, following past research in this domain.

Following the pretest-posttest experimental design, the data collection using the Qualtrics platform was conducted twice referred to as Time-1 and Time-2 over six months viz—August 2022 to January 2023. The Time-1 survey was administered to 170 blood donors in August 2022 (explained in Section 4.2) capturing data on their easy- and difficult prosocial behaviours, altruistic motives, demographics and religiosity before initiating nudging interventions. However, for the Time-2 survey conducted in January 2023, only 104 of the original 170 participants were included. This reduction in sample size occurred because only these 104 individuals were exposed to both nudging interventions (Interventions 1 and 2). As the research aim was to assess the hypothesized spillover effect based on the exposure of these interventions, the analysis was conducted on the overlapping sample of 104 participants across both periods (Time-1 and Time-2).

Table 1 summarizes the demographic profile of the study subjects.

Table 1
Participant profile.

Variable	Groups	N	%
Gender	Male	78	75.0 %
	Female	26	25.0 %
Age	25 years or less	80	76.9 %
	>25 years	24	23.1 %
Work experience	2 years or less	36	34.6 %
	>2 years	68	65.4 %
TOTAL		104	100.0 %

Among the subjects, 75 % were male 76.9 % were <25 years and 65.4 % had work experience of more than two years.

4.5. Data analysis

First, EFA via PCA was performed to establish the validity of constructs adapted for this study viz. easy prosocial behaviours and intentions for difficult prosocial behaviours. This analysis was conducted using IBM SPSS Statistics 26. Next, confirmatory factor analysis (CFA) was performed to confirm the unidimensionality and convergent validity of the construct for altruistic motives (Hair et al., 2010). Also, the fitness of the overall measurement model was examined using AMOS-25. Additionally, the discriminant validity of constructs is established using the Fornell and Larcker (1981) procedure.

Hierarchical OLS regression models were employed to test the hypothesis on the effectiveness of prosocial nudging in creating the spillover effects from easy behaviours to difficult behaviour intentions (H1) and moderating effects of participants improved pure and pseudo (reputation and kinship motives) motives on these effects (H3a–H3c). Additionally, to examine the difference in pure-motives and pseudo-motives (reputation and kinship motives) of participants due to prosocial nudging (H2a–H2c), paired sample *t*-tests were conducted. Before the estimation of OLS regression models, the assumptions of normality, homoscedasticity, multicollinearity and linear association between independent and dependent variables were confirmed (Hair et al., 2010). Residual analysis was employed to assess the normality of error terms. We used the Kolmogorov-Smirnov estimation to confirm the normal distribution of residues. The homoscedasticity of error terms was verified by plotting standardized residuals against predicted values. Finally, to confirm linearity, partial regression for each regression model. The results supported the pertinence of OLS regression for our analysis.

5. Results

5.1. Construct reliability and validity

The EFA via PCA results for easy- and difficult prosocial behaviours are summarized in Table 2.

The PCA results showed that for easy prosocial behaviour and difficult prosocial behaviour intention constructs, all indicators loaded on a single factor with an eigenvalue of 2.39 and 2.59 respectively; and represented 59.8 % and 86.62 % variance respectively; and have Cronbach alpha of 0.86 and 0.88 respectively. Further, to assess the convergent validity and unidimensionality of altruistic motives (Capraro et al., 2019), confirmatory factor analysis (CFA) was performed using AMOS-26 (Table 3).

The CFA result showed a composite reliability (CR) value >0.7 for all three altruistic motive dimensions (Hair et al., 2010). Next, the standardized loadings of individual indicators on their respective dimensions ranged from 0.77 to 0.88 (acceptable limit of >0.5, Hair et al., 2010). Further, the Cronbach α for the three motive dimensions ranged from 0.78 to 0.88. Overall, these results confirm the convergence validity of altruistic motive constructs used in the study. Further, we adopted Fornell and Larcker's (1981) approach to confirm the divergent validity of constructs. In this approach, the square root of each construct's average variance explained (AVEs is compared with its pairwise correlation (φ) with other constructs. If $\sqrt{AVE} > \varphi$, the divergent validity of the construct is established. Table 4 shows the results of the divergent validity test. Additionally, the goodness-of-fit indices of overall measurement model viz. relative chi-square index = 1.44 ($\chi 2/df < 3$), Comparative Fit Index = 0.96 (CFI > 0.90), Tucker-Lewis index =0.99 (TLI > 0.90); Standardized Root Mean Squared Residual = 0.07 (SRMR <0.08) were found to be within threshold limits suggested by Hu and Bentler (1999).

Table 2
PCA for construct validity.

Construct	Item description	Mean	St. Dev	Factor 1
	EBH1: I have given money to a stranger who needed it for his/her medical treatment (or asked me for it)	3.288	1.143	0.860
	EBH2: I have looked after sick friends and relatives who did not have a caretaker at home	3.558	1.378	0.735
	EBH3: I have offered my seat on a bus or train to a pregnant lady who was standing.	2.327	1.324	0.706
	EBH4: I have volunteered to assist the medical staff of a medical camp at my school/college/neighbourhood	3.019	1.244	0.785
Easy prosocial behaviours				
Eigenvalues				2.395
Initial % of variance explained				59.883
Rotation sums of squared loadings (total)				59.883
% of variance explained (cumulative)				59.883
	DBH1: I would like to register with hospitals and blood banks as a regular blood donor who can be contacted when need arises	3.462	0.917	0.928
	DBH2: I would like to register with hospitals and blood banks as a regular blood plasma donor who can be contacted when need arises	3.365	1.155	0.948
	DBH3: I would like to be an organ donor to a stranger after I die	3.481	1.260	0.916
Difficult pro-social behaviour				
Eigenvalues				2.599
Initial % of variance explained				86.625
Rotation sums of squared loadings (total)				86.625
% of variance explained (cumulative)				86.625

5.2. Results of hypothesis testing

For examining hypothesis H1 viz. effectiveness of prosocial nudging in creating a positive spillover from easy prosocial behaviours to difficult prosocial behaviour intentions; and H3a–H3c on moderating effects of three categories of altruistic motives on the proposed spillover, OLS-based hierarchal regression models were estimated (Hair et al., 2010) (Table 5). We estimated four regression models using intentions for difficult prosocial behaviours (at Time 2) as the dependent variable. The

Table 3
CFA results for Altruistic motives.

Construct	Item	Mean	St. Dev	CR	AVE
Pure altruistic motives (Cronbach α = 0.78)	ALT1: I try to work towards the well-being of living beings	4.33	0.83	0.88	0.72
	ALT2: It is important to me that I help others	4.42	0.78		
	ALT3: I think it is important to help the needy	4.04	1.03		
Reputation motives (Cronbach α = 0.81)	REP1: My colleagues would appreciate when they come to know about my helping nature	3.42	1.05	0.84	0.64
	REP2: I think that demonstrating helping behaviour will be recognized	3.13	1.14		
	REP3: It would let my friends and family believe that I am a good person	3.10	1.16		
Kinship motives (Cronbach α = 0.88)	KIN1: if I help others there is more of a chance that my close relatives and friends will receive the help when they need it	3.35	1.01	0.77	0.53
	KIN2: If I help others there is a high chance that needy people in my family receive help from others when they need it	3.40	1.00		
	KIN3: I believe that kind produces kind for myself, my family, and my friends	4.08	0.90		

Table 4
Assessment of divergent validity.

Constructs	Mean	St. Dev	EBH	ALT	REP	KIN	DBH
Easy prosocial behaviours (EBH)	2.77	0.81	0.74				
Pure altruistic motives (ALT)	2.89	0.40	0.35	0.85			
Reputational motives (REP)	2.58	0.65	0.25	0.29	0.80		
Kinship motives (KIN)	2.01	0.44	0.24	0.40	0.23	0.73	
Difficult prosocial behaviour intentions (DBH)	3.68	1.04	0.10	−0.01	0.03	0.13	0.90

first model (Model 1) only regressed control variables viz. subjects' demographics including age, gender and work experience, their altruistic motives as well as their difficult prosocial behaviour intentions at Time-1. Model 2 included the direct effect of easy prosocial behaviour (at Time-1) along with the control variable. Model 3 involves adding the interaction effect of pure- and pseudo-altruistic motives (at Time-2) along with independent variables and control variables. The variance inflation factors (VIF) in all regression models were found to be <3 (Hair et al., 2010) which verified the nonexistence of multicollinearity issues.

The regression results showed that the addition of independent variables and interaction terms incrementally improved the model fitness as implied by significant Δ Adjusted R^2 for Models 2 and 3 (Table 5). The % of variance explained by Model 3 was found to be 62 % with F-value = 2.78**. indicate prediction. Among the control variables, work experience (β = 0.09***, t-value = 3.5) showed a weak impact on intentions towards difficult prosocial behaviours. Also, participants' pure altruistic motives at Time-1 showed a direct and significant effect on intentions towards difficult prosocial behaviours at Time-2 (β = 0.13**, t-value = 2.16).

The results showed a significant positive spillover effect (β = 0.14***, t-value = 2.45) of participants' easy prosocial behaviour at Time-1 on their difficult pro-social behaviour intentions (Time-2) post implementation of prosocial nudging interventions. Thus H2 was

Table 5
OLS regression results.

	Difficult pro-social behaviour intention (Post-intervention – Time-2)			Hypothesis results
	Model 1	Model 2	Model 3	
Control variables				
Age	0.13 (0.97)	0.13 (0.95)	0.06 (0.39)	
Gender	0.2 (1.37)	0.2 (1.39)	0.19 (1.32)	
Work experience	0.16** (2.09)	0.13** (2.13)	0.09*** (3.5)	
Difficult pro-social behaviour intentions (Time-1)	0.3** (3.02)	0.19** (2.39)	0.13** (2.16)	
Pure altruistic motives (Time-1)	0.22** (2.11)	0.22** (2.45)	0.13** (2.19)	
Reputation motives (Time-1)	*0.11** (1.81)*	0.1** (2.14)	*0.13** (1.68)*	
Kinship motives (Time-1)	0.02 (0.1)	0.02 (0.11)	−0.1 (−0.53)	
Independent variables				
Easy pro-social behaviour (Time-1)		0.32** (2.19)	0.14** (2.45)	*H1 supported*
Moderators				
Pure altruistic motives (Time-2)			0.39** (2.21)	
Reputation motives (Time-2)			0.15*** (3.42)	
Kinship motives (Time-2)			0.02 (0.06)	
Interaction effects				
Easy pro-social behaviour (Time-1) × Pure altruistic motives (Time-2)			0.21*** (3.46)	*H3a supported*
Easy pro-social behaviour (Time-1) × Reputation motives (Time-2)			0.1** (2.09)	*H3b supported*
Easy pro-social behaviour (Time-1) × Kinship motives (Time-2)			0.08 (0.56)	*H3c not supported*
F-value	3.23** [df1 = 9, df2 = 94]	2.87** [df1 = 10, df2 = 93]	2.78** [df1 = 16, df2 = 87]	
R^2	0.31	0.42	0.68	
Adjusted R^2	0.25	0.35	0.62	
Δ Adjusted R^2	–	0.11**	0.13**	

*** $p < 0.001$.
** $p < 0.01$.
* $p < 0.05$.

supported. Further, the results of interaction effect tests (Model 3) revealed the significant positive moderating effect of pure altruistic motives (Time-2) (β = 0.21***, t-value = 3.46) and reputation motive (Time-2) (β = 0.1**, t-value = 2.09) on the effectiveness of nudging interventions (H3a & H3b supported). However, the moderating effect of kinship motives (H3c) was not supported.

For examining hypothesis H2a–H2c viz. there is a difference in participants' altruistic motives after implementation of prosocial nudging interventions, the paired t-tests were conducted (Table 6). The results showed that post-intervention scores for purely altruistic motives (mean difference = 1.01; t = 10.55***) are higher, whereas post-intervention scores for pseudo motives viz. reputation (mean difference = −0.44; t = −3.28***) and kinship motives (mean difference = −1.7; t = −12.05***) were lower and the mean difference was statistically significant. Further, the post-intervention scores of difficult pro-social behaviour intention were higher and statistically significant

Table 6
Test of difference between altruistic motives at Time-1 and Time-2.

Hyp	Variable	*N*	Pre-intervention (Time-1)		Post-intervention (Time-2)		Effect of intervention			Result
			Mean	*Std Dev*	*Mean*	*Std Dev*	*Mean diff.*	*Std Dev*	*t-Value*	
H2a	Pure altruistic motives	104	2.89	0.40	3.89	0.66	1.01***	0.69	10.55*	Supported
H2b	Reputation motives	104	3.01	0.76	2.58	0.65	−0.44**	0.95	−3.28	Supported
H2c	Kinship motives	104	2.01	0.44	3.71	0.90	−1.7***	1.02	−12.05	Supported

*** $p < 0.001$.
** $p < 0.01$.
* $p < 0.05$.

(mean difference = 1.32; $t = 12.29$***).

6. Discussion

6.1. Main results and practical implications

In this study, we investigated the impact of prosocial nudging on positive spillover effects of easy prosocial behaviour on young adults' behaviourial intention to adopt difficult prosocial behaviour subsequently and found support for this hypothesis (H1 accepted). Our results support the findings of previous studies on prosocial spillover effects suggesting that prosocial nudging can be used as an effective tool for encouraging individuals demonstrating prosocial behaviour to indulge in even more prosocial behaviour afterwards (Ghesla et al., 2019; Nilsson et al., 2017). These results imply that interventions like prosocial nudging are instrumental in facilitating spillover between easy to difficult prosocial behaviour. These results can explain moral consistency effects suggesting that increased prosocial behaviour opportunities triggered by prosocial interventions like nudging lead to even more difficult prosocial behaviour in the future (Brandon et al., 2017; Grimm & Mengel, 2012). Our study not only supports this claim but also shows a new direction to the postulations of moral licencing according to which individuals who showed prosocial behaviour in the past tend to be reluctant of this behaviour in the subsequent prosocial action opportunities. The moral licencing effects have been widely studied by previous prosocial works suggesting that moral licencing inhibits prosocial behaviour spillover (e.g., Mullen & Monin, 2016; Hofmann & Müller, 2018). The results of our experiment confirm that prosocial nudging can effectively dilute the inhibiting impact of moral licencing on prosocial behaviour spillover.

These findings provide valuable insights for policymakers, social welfare groups and for-profit and not-for-profit social enterprises who strive hard to persuade young adults to difficult prosocial behaviour (organ donation in the current experiment). Organizations and policymakers can identify young adults as having prosocial attitudes and can effectively use prosocial nudges such as norm-based and empathy-based campaigns to encourage them to consistently demonstrate prosocial behaviour in the future even in more difficult decision situations. The norm-based campaigns are particularly useful when a large percentage of the targeted population follows related/similar prosocial practices (Alt et al., 2023). For instance, in this study, we used a norm-based campaign for prosocial nudging in the third intervention (poster campaign – highlighting the fact that young adults represent the largest numbers of new and current blood donors (Russell-Bennett et al., 2015). However, organizations/policymakers using norm-based nudges should be mindful of the reliability and precision of the information shared with the target group. Similarly, empathy-based nudges work effectively when transparency is maintained. While sharing the stories of the beneficiaries of the desired prosocial behaviour, attempts should be made to maintain transparency and reduce information (Chern, 2017).

Next, we examined the altruistic motives of young adults demonstrating prosocial behaviour (H2a–H2c, H3a–H3c) as scholars suggest that positive outcomes should not take precedence over positive motives for prosocial behaviour (Raihani & Power, 2021). First, we recorded the impact of prosocial nudging on both pure- and pseudo-altruistic motives (reputation and kinship) and the experiment supported our prediction (H2a–H2c supported). The deeper analysis of results revealed that while prosocial nudging had a positive significant impact on pure-altruistic motives, reputation and kinship motives were negatively impacted. These findings support the scholarly viewpoint that altruistic motives can be evoked and strengthened by perspective-taking (Underwood & Moore, 1982). In the second intervention (street play) we sought to examine the effectiveness of prosocial nudging that had imagine-other perspective. The results corroborated the findings of previous studies which claimed that perspective-oriented nudging grounded in behaviourial science leads to strong altruistic motives (Robitaille et al., 2021). It is good news for policymakers and organizations perusing young adults to actively engage in difficult prosocial behaviour. Attempts should be made to further strengthen the altruistic motives of young adults who are predisposed towards prosocial behaviour as motives for prosocial behaviour in a given context (prosocial behaviour in the current context) have a significant long-term impact on individuals' behaviour. Prosocial nudges with perspective orientation may be used as a tool to generate empathy for the needy which induces altruistic motives for prosocial behaviour and thus can be instrumental in encouraging young adults to move from easy to difficult prosocial behaviour. Thus, reflection on the gravity of the social issue (through perspective-based nudging) to an agent (individuals predisposed to prosocial behaviour in the current context) is more likely to encourage actions to address that issue with more commitment rooted in their motives (pure altruism). While prosocial nudging strengthened the pure-altruistic motive, we found a significant impact on pseudo-altruistic motives in the opposite direction. Additionally, we examined the moderating effect of altruistic motives after prosocial nudging on prosocial spillover behaviour and found partial support for our hypotheses (H3a & H3b accepted, H3c rejected). Our results indicated that after prosocial nudging positive moderating effect of pure-altruistic motives on behaviour spillover from easy to difficult prosocial behaviour was enhanced (H3a). It implies that prosocial nudging induced greater empathy and concern for the well-being of the needy (pure altruism) among young adult participants and they showed stronger behaviourial intention to adopt difficult prosocial behaviour. Moreover, out of the two pseudo-altruistic motives, while kinship showed no significant moderating effect (H3c rejected) reputation motives after prosocial nudging showed negative moderating effects and thus inhibiting spillover effects from easy to behaviourial intention to adopt difficult prosocial behaviour (H3b accepted).

It implies that prosocial nudging can work in two directions: fostering pure-altruistic motives and diminishing pseudo-altruistic motives. This has important practical implications because young adults are extremely sensitive to social status reflections. They are motivated to pursue behaviour which is a source of respect and high status among their peers viz. reputation motives (Dweck & Yeager, 2018). Therefore, it is necessary to understand how prosocial nudging affects young adults' reputation motives for prosocial behaviour. It is important to note that due to the reinforcing capacity, pure-altruistic motives ought to be stretched to yield long-term benefits but pseudo-altruistic motives such as reputation lead to only short-term outcomes and thus may not invoke

consistent prosocial behaviour. Our experiment results suggest that prosocial nudging can serve a dual purpose for organizations and policymakers who aspire to encourage consistency in prosocial behaviour among young adults through spillover effects.

While our results provide meaningful insights on relationships between prosocial behaviour spillover and altruistic motives, and the interactive effects of prosocial nudging on these relationships, our findings should be carefully used. In our experiment set-up, the young adults' spillover was examined between similar behaviours i.e., easy prosocial behaviour (blood donation) to difficult prosocial behaviour (behaviourial intention to donate organs). Results may show variation if the subsequent behaviour under study is in the opposite direction (anti-prosocial behaviour).

6.2. Theoretical contribution

This study contributes to theory building and expansion in multiple ways by integrating and extending insights from behavioural spillover theory, altruistic motivation theory, and nudging for prosocial behaviours. Specifically, this study explains how pure and pseudo-altruistic motives impact prosocial behaviour transfer and the mechanisms that facilitate such spillover in a nudged environment. Examining the role of nudges as a catalyst for prosocial behavioural spillover and testing and integrating pure and pseudo-altruistic motives as moderators in the model, constitutes a theoretical contribution, as it represents a step towards building an integrated multidisciplinary model of prosocial behaviour spillover mechanism that relates pure and individual's pseudo altruistic motive for prosocial behaviour and explains how subtle interventions can trigger a chain reaction of altruistic actions leading to prosocial behaviourial shifts. Additionally, the investigation of altruistic motives (pure altruism, reputation-driven motives, and kinship-based altruism) as moderators in the spillover process provides a more nuanced understanding of the motivational pathways that underpin prosocial behaviour. This expands the application of altruistic motivation theory in the behaviourial spillover context by highlighting the differential impact of these motives on behaviour spillover, particularly in transitioning from easier to difficult prosocial actions. Furthermore, the study advances the concept of nudging by exploring its long-term implications beyond immediate behavioural change, positioning nudges as a strategic tool for fostering sustained prosocial engagement in young adults. These theoretical advancements encourage future studies to use the proposed integrated model of this study for interdisciplinary exploration in other relevant contexts such as; nudging for a healthy lifestyle, nudging for sustainability etc.

7. Conclusion and limitations

This study investigates the extent to which prosocial nudging is instrumental in fostering spillover effects of prosocial behaviours among young adults. In addition, it examines how the interplay of prosocial behaviourial spillover and altruistic motives is shaped in a nudged environment. The results of a longitudinal quasi-experiment involving the on-campus application of nudging interventions at a higher education institute offer insights into the design of prosocial nudging mechanisms to support behaviourial shifts among young adults. The findings demonstrate that nudging also enables the transition of pseudo to pure altruistic motives of young adults which further accelerates their prosocial behaviourial spillover from easy to difficult prosocial behaviours.

This study examined the role of nudging to stimulate prosocial behaviourial spillovers in the young adult cohort. Thus, the findings may not be generalizable to Millennials and other generation cohorts which are also influential for building a socially responsible society. Thus, future studies might consider choosing study subjects from different generational cohorts to compare the effectiveness of nudging mechanisms. Additionally, in this study, the procedures of quasi-experiments as well as the interventions and treatments are designed to ensure internal validity. However, additional investigations based on field observations can be conducted to enhance the generalizability and realism of findings. Another interesting research direction for future studies is to assess and compare the individual-level effect of different types of nudging interventions targeting prosocial attitudes. For example, the effect of 'social norm' nudge like street play to create blood donation awareness versus the effect of 'informational' nudge like poster messages to promote monetary donations for social causes. However, in this study, the analysis was limited to testing the combined effect of a set of nudging interventions on the altruistic motives and behaviourial spillover of young adults. The duration of our longitudinal study was six months, which is comparable to nudging experiments for stimulating healthy eating, sustainable flight adoptions, energy conservation and other sustainable choices (Demarque et al., 2015). However, a longer timeframe ranging over a few years might offer a more accurate reflection of the instrumentality of nudging interventions to facilitate prosocial behaviourial shifts.

CRediT authorship contribution statement

Parul Gupta: Writing – original draft, Visualization. **Anupama Prashar:** Methodology, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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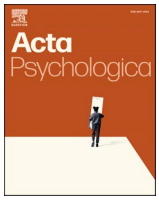

Corrigendum

Corrigendum to Prosocial behaviourial spillover and nudging: A longitudinal quasi-experimental study on the moderating role of altruistic motives [Acta Psychol. 255(2025) 104887]

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The authors would like to apologize for an oversight related to the Data Availability section. The correct statement should be: All data supporting the findings of this study are available upon request.

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