Lender retention of online prosocial lending: a self-determination perspective

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Abstract

Purpose – Prosocial lending in online crowdfunding has flourished in recent years, and it has become a new way to fundraise for philanthropy. However, there is almost a 70% user attrition rate in crowdfunding. The purpose of this study is to understand what the lender's lending experience and social connection influence lender retention of online prosocial lending from a self-determination perspective.

Design/methodology/approach – Drawing on self-determination theory (SDT), this research utilizes a quantifiable method for factors of the lender's lending experience and social connection. Additionally, the research constructs economic models to explore the impacts of these factors acting as the necessary conditions for basic psychological needs on lender retention, using a large-scale sample of over 380,000 lenders from Kiva.

Findings – The results indicate that, from the lender's lending experience aspect, the loan narratives with more profit language in the last lending and the failure of past participation are negatively related to lender retention. Regarding the lender's social connection aspect, their friends or small lending teams are positively related to lender retention, while whether they are invited and lending team size show negative influence. Furthermore, results indicate the moderating effects of the disclosure of lending motivation.

Originality/value – This research explores the mechanism of lender retention of online prosocial lending, providing a self-determination perspective about how previous experience influences long-term lending behavior. The study offers significant implications for the literature on online philanthropy, SDT and user retention of online platforms. At the same time, the study provides an understanding of the effects of different aspects of SDT.

Keywords Lender retention, Online prosocial lending, Crowdfunding, Lending experience, Social connection, Self-determination theory

Paper type Research paper

1. Introduction

In recent years, philanthropy has gained some new vitality with the emergence of online crowdfunding (Berns *et al.*, 2020). There are two main ways of realizing philanthropy in crowdfunding: one is charitable donation crowdfunding, which means that promoters crowdfund for health or education and donors donate money to help others voluntarily (Liu *et al.*, 2018; Wei *et al.*, 2021), like DonorsChoose, Qingsongchou and so on; the other is online prosocial lending, where lenders make voluntary lending. That is to say, if the project fails, there will be no return, but, if the project succeeds, the lending will return to lenders, who

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can reuse this money to continue lending (Allison *et al.*, 2015; Burtch *et al.*, 2014), like Kiva [1]. Specifically, online prosocial lending is both financial and prosocial in nature (Berns *et al.*, 2020; Galak *et al.*, 2011), and the complex motivations of such lenders have attracted scholarly attention increasingly (Berns *et al.*, 2020; Defazio *et al.*, 2020; Dorfleitner *et al.*, 2019). On the one hand, online prosocial lending which embodies individual social responsibility is morally and ethically driven to help people in trouble selflessly. On the other hand, it promotes social sustainable development by providing funds for individuals in the stage of starting a business, which alleviates world poverty to some extent (Spanos, 2018).

Unfortunately, scholars found that only 27% of first-time donors made a second donation, with user attrition rates of more than 70% on crowdfunding platforms (Althoff and Leskovec, 2015). On average, the cost of inviting a new user to participate in a crowdfunding campaign is two to three times that of a new donation (Sargeant, 2013; Sargeant and Hudson, 2008). As for online prosocial lending with multiple motivations including prosocial and financial issues, user attrition is a more significant phenomenon (Zhao *et al.*, 2020). While online prosocial lending has gained rapid popularity (Allison *et al.*, 2015; Berns *et al.*, 2020; Dorfleitner *et al.*, 2019; Gerber and Hui, 2013), the phenomenon of "crowdfunding fatigue" has occurred on these platforms, where the growth of a crowdfunding campaign mainly depends on the new user engagement, but this engagement has dwindled. Thus, we must gain a more comprehensive understanding of sustainable lending behavior.

Indeed, our knowledge about online prosocial lending behavior in a long-running process is still scant, and it is represented by *lender retention*, which refers to the fact that a lender continues to engage in online prosocial lending one after another (Althoff and Leskovec, 2015). There are mainly two gaps: first, there are many studies from the perspective of the success of loans, determinants mainly include racial discrimination (Luo and Ge, 2018), culture difference and geography (Burtch *et al.*, 2014), linguistic features (positive or negative), moral foundations in profile descriptions and economic signals (as illustrated by market orientation) and normative signals (as illustrated by psychological capital) embedded in borrower narratives (Jancenelle and Javalgi, 2018). Meanwhile, from the perspective of lender participation motivations, determinants mainly include recommending teams (Wei *et al.*, 2021), the reputation of the lender group (Luo *et al.*, 2016), high altruistic concerns (Ge *et al.*, 2016), entrepreneurial narratives (Allison *et al.*, 2015) and strategic motives (Berns *et al.*, 2020). However, prior studies focus on the lending process rather than the relending process. As a typical relending process, how lending-related and lender-related factors influence lender retention has not been carefully investigated (Xiao and Yue, 2021; Zhao *et al.*, 2020).

Second, these lending- and lender-related factors are usually cross-sectional and they influence lending over the same period in prior studies (Allison *et al.*, 2015). However, and more importantly, lender retention is influenced by the users' previous experience on the platform (Xiao and Yue, 2021). From the lending- and lender-related view, previous experience can be divided into the lender's lending experience (Xiao and Yue, 2021) and established social connection (Luo *et al.*, 2016; Wei *et al.*, 2021). Lending experience represents the historical lending behaviors like the success rate of past lending (Burgers *et al.*, 2015; Xiao and Yue, 2021), lender's established social connection represents the friends and the teams in which the lender participates during the lending procedure, there are some characteristics of these connections like group membership (Luo *et al.*, 2016; Wei *et al.*, 2021). These determinants could jointly form a complex effect with financial and prosocial motivations to influence the relending decision making (Allison *et al.*, 2015). However, prior studies have mainly explored a campaign's external influencing factors on the lender (Althoff and Leskovec, 2015; Zhao *et al.*, 2020), ignoring the understanding of the previous experience from a self-determination perspective. Therefore, to address these two gaps, we adopt the online prosocial lending context and utilize self-determination theory (SDT) (Deci and Ryan, 2000; Yang and Yin, 2020) to understand the mechanism of the lender's lending experience

and social connection influencing lender retention (Berns *et al.*, 2020; Galak *et al.*, 2011). Our study is designed to answer two research questions:

RQ1. Do the lender's lending experience and social connection affect lenders' retention?

RQ2. If so, how do these factors influence lender retention?

SDT is a motivation theory that asserts that the satisfaction of basic psychological needs is essential for the self-determination of individual behaviors and further affects individual performance (Deci and Ryan, 2000; Yang and Yin, 2020). This theory is usually used in the lending process (Allison *et al.*, 2015); however, in the long run, the lender's motivation will change with the different feedback from different experiences and activities. From this theoretical perspective, these internalization processes could occur to different degrees from the three dimensions of SDT, which are *autonomy*, *competence* and *relatedness*. Therefore, SDT is suitable to explore lender retention from the perspective of the change of motivations led by different feedback.

To test our theoretical model, we examine a large-scale sample of about 380,000 lenders from Kiva, one of the largest online prosocial lending platforms. By conducting logistic regression, we find that different factors of lending experience and social connection have effects on lender retention to different degrees. First, a profit language in the last loan description suppresses lender retention by impeding autonomy, which shows that the profit language cannot be considered a simple signal of loan quality in most cases. Second, the failure experience of participation, which may create a sense of incompetence, also negatively influences lender retention. Third, the lender with more friends or lending teams is more likely to continue to lend in the future, while the average size of lending teams shows a negative effect. Meanwhile, our findings confirm that the disclosure of lending motivation has moderating effects on all the above directing effects.

Our research makes three main contributions. First, our study has contributions to online philanthropy literature which is an advanced information system field (Wei *et al.*, 2021). To our knowledge, this study provides some powerful empirical insights into lender retention of online prosocial lending. Second, this study contributes to SDT. We construct the relationship between the lender's lending experience, social connection factors and self-determination to determine the relending behavior. This is an expansion of SDT to the online prosocial lending phenomenon and we explore the utilization boundary in this phenomenon. Third, this study makes a contribution to the literature about user retention of online platforms. Studies about the complex motivations of lending are still scant in the context of online philanthropy; moreover, existing studies on online user retention are conducted through surveys and qualitative studies. Our study expanded the research context and methodologies. Detailed theoretical and practical contributions are introduced in Section 6.

2. Theory and hypotheses development

2.1 Online crowdfunding and online prosocial lending

With the rapid growth of the Internet, it became possible to construct connections between investors and small entrepreneurs who lack financial capital (Belleflamme *et al.*, 2014). Thereupon, online crowdfunding platforms have stepped into the global spotlight in recent years. In online crowdfunding platforms, entrepreneurs or individuals solicit money for their projects, while investors around the world contribute a small amount to projects that they support (e.g. Zhao *et al.*, 2022a). Researchers in the IS discipline have broadly examined all types of crowdfunding, they are equity-based and lending-based crowdfunding, reward-based crowdfunding, donation-based crowdfunding and online prosocial lending, which are displayed in Table 1 (Allison *et al.*, 2015; Althoff and Leskovec, 2015; Burtch *et al.*, 2014; Xiao and Yue, 2021; Zakhlebin and Horvát, 2019; Zhang *et al.*, 2020, 2022; Zhao *et al.*, 2020). More specifically, Belleflamme *et al.* (2014) suggested that individual equity-based or lending-based crowdfunding is a way to develop a venture through the process of fundraising. Zhang

Table 1. The characteristics of all types of crowdfunding

Type	Participants	Reward (for people who provide capital)	Whether to return the principal (for people who seek capital)	References
Equity-based and lending-based crowdfunding	Investor and entrepreneur	Monetary reward	Equity-based: No; Lending-based: Yes	Belleflamme *et al.* (2014), Xu and Chau (2018), Zakhlebin and Horvát (2019), Zhang *et al.* (2022)
Reward-based crowdfunding	Investor and entrepreneur	Product or service	No	André *et al.* (2017), Bretschneider and Leimeister (2017), Giudici *et al.* (2018)
Donation-based crowdfunding	Donor and fundraiser	None	No	Althoff and Leskovec (2015), Xiao and Yue (2021), Zhang *et al.* (2020)
Online prosocial lending	Lender and borrower	None	Yes	Allison *et al.* (2015), Burtch *et al.* (2014), Zhao *et al.* (2020)

et al. (2020) found that website acceptance, crowd familiarity and donation reciprocity are the significant factors that influence the success of the project on donation-based crowdfunding platforms. Giudici *et al.* (2018) proposed the concept of local altruism, which means that, in terms of reward-based crowdfunding, altruistic people tend to fund crowdfunding projects in the geographical area where they are living. Luo *et al.* (2022) found that prosocial crowdfunding has a positive effect on traditional microfinance institutions, including improving these institutions' sustainability and decreasing their interest rates. In this paper, we focus on online prosocial lending.

Impoverished entrepreneurs are faced with a shortage of financial capital as they struggle to obtain funding from traditional financial institutions in both developing and developed countries (Allision *et al.*, 2015). Online prosocial lending, in which lenders have no reward and borrowers need to return principal if the loan is not in default (Allision *et al.*, 2015; Burtch *et al.*, 2014), provides impoverished entrepreneurs with access to raise funds for their projects without interest. Studies on online prosocial lending agree that lenders are both financially and prosocially motivated (Berns *et al.*, 2020; Galak *et al.*, 2011). Specifically, Galak *et al.* (2011) suggested that lending decisions are both financial and prosocial in nature when lending via online microfinance. Berns *et al.* (2020) identified that, while lenders are prosocial in nature, they tend to provide funding based on strategic motivations and projects' profiles.

Specifically speaking, the motivation of people to participate in online prosocial lending has been examined in terms of social justice, development, religious duty, empathy and altruism (Gerber and Hui, 2013; Liu *et al.*, 2012; Mittelman and Rojas-Méndez, 2013). In general, online prosocial lending is mostly ethically motivated and self-determined to satisfy inner psychological needs, whereas in traditional investments, investors receive some rewards. However, the prosocial and financial motivations are interactional, Allison *et al.* (2015) found that the extrinsic cues in entrepreneurial narratives reduced lenders' incentives. Additionally, some mechanisms are introduced to increase lenders' participation, such as a lending team program (Ai *et al.*, 2016; Chen *et al.*, 2017).

Many researchers have studied project performance in online prosocial lending from the perspectives of project, lender or borrower (Chen *et al.*, 2018; Chung *et al.*, 2021; Jancenelle and Javalgi, 2018; Moss *et al.*, 2018; Zhao *et al.*, 2022c). For example, Jancenelle and Javalgi (2018) investigated the effect of the moral foundation cues embedded in profile descriptions on lenders' lending decisions. Chen *et al.* (2018) examined the motivations of lenders and borrowers and how they would participate in two types of online prosocial lending platforms

(Kiva and KivaZip). To indicate the research status, we summarized the research about online prosocial lending, and the corresponding information is shown in Appendix 2. According to the summary, we could find that the research about empirically exploring what factors influence lender retention in online prosocial lending is still scarce. Furthermore, previous studies have not investigated the effects of the lender's lending experience and social connection on lender retention, and how these influencing factors represent self-determination.

2.2 Prosocial lender retention

Although there are few studies about prosocial lender retention, some related works have been carried out in the following. First, as online prosocial lending is supported by online platforms and relies on the participation of users, prosocial lender retention can be regarded as a special case of user retention of online platforms. Many studies have found that user retention is significantly affected by their experience on the online platform (Halfaker *et al.*, 2011; TeBlunthuis *et al.*, 2018). For example, Khalifa and Liu (2007) found that satisfaction is an important factor in a user's online repurchase intention. There are other vital constructs that are related to user retention, such as commitment (Fullerton, 2014; Vatanasombut *et al.*, 2008), identification (Bhattacharya and Sen, 2003) and justice (Siu *et al.*, 2013).

Second, many studies about retention have been carried out in the context of crowdfunding. For example, Zakhlebin and Horvát (2019) looked at equity-based crowdfunding and confirmed that more investments, a higher success rate and more investment novelties positively affect investor retention. As for reward-based crowdfunding, Liao *et al.* (2017) conducted a quantitative analysis of investors' temporal supporting patterns and found that the success rate and the favorable connection with the fundraiser influence investor retention. Due to the prosocial nature of online prosocial lending, closely related work is found in the context of donation-based crowdfunding. In this context, some studies have suggested that donor retention is affected by commitment, trust and donor experience. For example, Althoff and Leskovec (2015) presented a study on donor retention in an online charitable crowdfunding platform and found a set of influencing factors that are related to donor retention, such as commitment and trust. Xiao and Yue (2021) decomposed donor retention into two decision processes, one is the donation process, and the other is the latent attrition process or completely inactive and constructed a joint model of both donors' contribution and attrition.

Compared with the above three types of crowdfunding, *online prosocial lending* has several distinctive features: First, borrowers need to return principle even though lenders do not pursue any reward (Burtch *et al.*, 2014); second, the lending behavior is prosocial, and the goal of lending is poverty alleviation (Galak *et al.*, 2011; Zhao *et al.*, 2022b); third, the online prosocial lending platform provides an internal social network, which increases contributions (Ai *et al.*, 2016); and fourth, the lenders' previous experience and behavior greatly influence lender retention (Zhao *et al.*, 2020). Because these features lead to a different phenomenon from the other three types of crowdfunding (Xiao and Yue, 2021), how to improve lender retention of online prosocial lending is a serious challenge. As mentioned in the fourth feature, many studies have suggested that the lender's lending experience and social connection affect lender retention (Khalifa and Liu, 2007; Zhao *et al.*, 2020). Especially, a lender's last lending can impact his/her following behaviors, including relending (Hang *et al.*, 2022; Zhao *et al.*, 2017). According to the mechanism, Zhao *et al.* (2020) constructed a joint deep survival model to predict lender retention, which integrates lender- and lending-related features (e.g. the lending records and the lender's introduction) and project features. Moreover, social connections can generate peer effects that influence a lender's decision to remain on the platform (Ferreira *et al.*, 2019; Miguel *et al.*, 2018). For example, the greater social tie strength and friend retention, the greater lender retention (Kayes and Chakareski, 2015). However, there is little empirical research about how factors, especially previous experience, influence the relending behavior in the context of online prosocial lending.

2.3 Self-determination theory and online prosocial lender retention

Online prosocial lender retention is different from lenders' behavior for single lending, which can be decomposed into the lending process and latent attrition process (Xiao and Yue, 2021). When prosocial lenders gain psychological satisfaction through online prosocial lending, such as feeling valued and connected, they are likely to lend again. Whether the online prosocial lender chooses to remain or not depends on the change of self-determination caused by historical participation. The key is to understand the relationships between influencing factors within historical participation and subsequent online prosocial lending behavior from the motivation perspective. Thus, SDT is suitable to explore how the lender's lending experience and social connection within historical participation, which may support or thwart the satisfaction of psychological needs, affect the prosocial lender's decision to continue their lending.

SDT is a motivation framework, which asserts that an individual's motivation for behavior depends on the satisfaction of three basic psychological needs autonomy, competence and relatedness. Those three psychological needs are innate for individuals and are considered to be essential conditions for high performance, healthy growth and well-being (Ryan and Deci, 2000a, b). Autonomy refers to the need to freely choose our actions following our willingness (Deci and Ryan, 2000). Online prosocial lenders are autonomously motivated when they can choose which loan to lend based on their desire. *Competence* is the need to successfully finish challenging tasks and obtain expected outcomes (Deci and Ryan, 2000). Online prosocial lenders are competent when they finish lending and further receive positive feedback. *Relatedness* is the desire to establish mutual respect and connection with others (Deci and Ryan, 2000). Online prosocial lenders feel related when they act in a united community and help others. Environmental and social conditions which support basic psychological needs are likely to facilitate individuals' motivation, whereas those conditions which meet no need tend to thwart it. With the basic needs satisfied, individuals show more motivation, which facilitates their behaviors in turn.

Moreover, SDT distinguishes between intrinsic motivation and extrinsic motivation (Ryan and Deci, 2000a). SDT suggests that intrinsic motivation and extrinsic motivation can simultaneously exist in an individual to various degrees; they are not mutually exclusive. Additionally, individuals can gain greater intrinsic motivation through internalization, which is a process of the integration of value and behavioral regulations (Ryan and Deci, 2000a). SDT has been widely applied to explore intrinsic motivations for high performance, healthy growth, development and well-being in many contexts including education (Nikou and Economides, 2017; Reeve, 2012), organizations (Deci *et al.*, 2017; Gagné and Deci, 2005; Wang and Hou, 2015), online communities (Kuem *et al.*, 2020) and so on. Importantly, SDT has also been introduced into the crowdfunding context (Allison *et al.*, 2015; Bretschneider *et al.*, 2014; Liu *et al.*, 2014) to explore contribution behaviors. For example, Allision *et al.* (2015) drew on SDT to examine how intrinsic and extrinsic cues in entrepreneurial narratives influence lending decisions.

2.4 Hypotheses development

According to the literature review on the antecedents of lender retention on the online prosocial lending platform, the participants' experiences (e.g. lending experience) and the social activities (e.g. social connection) are important antecedents within historical participation which can significantly influence loyalty, commitment and retention (Nitzan and Libai, 2011; Xiao and Yue, 2021). Therefore, our research focuses on exploring the influence of a lender's previous lending behavior on their retention decision from the perspective of the three dimensions of SDT. We suggest that the lender retention decision is based on the lender's self-determination for their next lending, which can be influenced by two large groups of factors: the lender's lending experience and the lender's social connection. Meanwhile, we have adopted the perspective of the three dimensions in SDT, autonomy,

competence and relatedness to understand these factors' influence on lender retention. The theoretical model is shown in Figure 1.

Specifically, in the lending experience set, there are generally two kinds of experiences, which are motivated by prosocial motive and financial motive, respectively. Prosocial motive means lenders devote themselves to helping needy entrepreneurs and diminish poverty without any reward; financial motive means lenders desire to withdraw their funds and relend, in which they make lending decisions after examining loan quality and repayment risk (Galak *et al.*, 2011). Therefore, in this set, we examine two observable factors of lending experience from these two motives: experienced lending profit language and expired lending number. Experienced lending profit language represents the lender's willingness, like the prosocial motive in historical online prosocial lending, which could reflect the autonomy in SDT (e.g. Allison *et al.*, 2015). As for the expired lending number, it represents whether lenders obtain the expected outcome, like financial motive, which could reflect the competence in SDT (e.g. Chen and Jang, 2010). In the lender's social connection set, the lender's historical established connection represents their desire to establish connections with others on the platform, which could reflect the relatedness in SDT (e.g. Chen *et al.*, 2017). Therefore, the influence of the lender's lending experience and social connection on lender retention could be understood by the three dimensions of SDT. Next, we will propose our hypotheses from the SDT perspective.

First, we understand the influence of lending experience on lender retention from the autonomy dimension in SDT. We examine the profit language embedded in the loan's description of the last funding experience as the experienced profit language. Task framing, such as linguistic cues, is thought to be influential to the individual's motivation (Allison *et al.*, 2015; Cimpian *et al.*, 2007). Previous studies have found that linguistic style is associated with fund-raising success on crowdfunding platforms (Allison *et al.*, 2015; Jancenelle *et al.*, 2018; Parhankangas and Renko, 2017; Wang *et al.*, 2020). For example, Jancenelle *et al.* (2018) found that lenders tend to provide funding to loans that showed current hardship or concern for people because online prosocial lenders appear to pick borrowers using a donation-based logic rather than an investment-based logic.

As the extrinsic rewards, experienced profit language decreases the individual intrinsic motivation by preventing an individual from gaining satisfaction according to SDT (Deci and Ryan, 2000). SDT asserts that rewards tend to increase extrinsic motivation, whereas rewards provided to be controlling tend to decrease intrinsic motivation (Deci *et al.*, 1999). Allision *et al.*

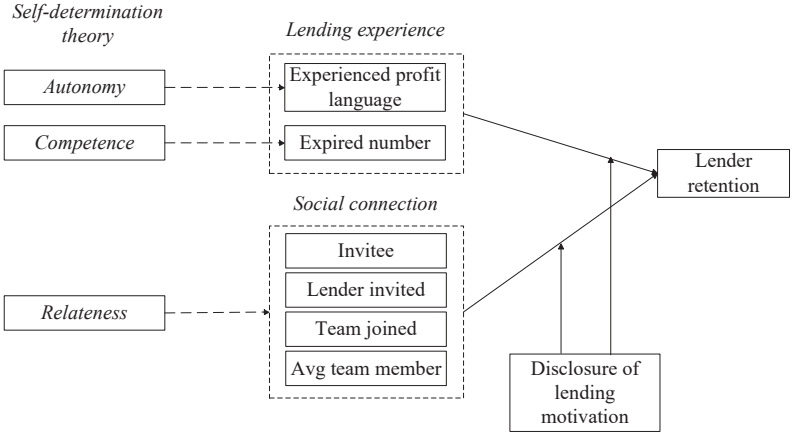

Figure 1.
Research framework

(2015) have given an interesting example: when given a non-controlling instruction, such as "go run one lap around the track," participants nearly completed the instruction relying on intrinsic motivation without any extrinsic reward. However, when the instruction was changed to "go run one lap around the track in two minutes or less and win five dollars," there was a controlling reward. In the context of online prosocial lending, displayed with external cues, lenders feel controlled in a rewarding environment (Allision *et al.*, 2015), resulting in an external perceived locus of causality and undermining the intrinsic motivation, and thus lenders may not relend. Therefore, the profit language in the last lending experience has damaged the lender's autonomy to freely choose a loan depending on themselves. Therefore, we hypothesize that:

H1a. The degree of profit language in the loan description text in the last lending experience is negatively related to lender retention in online prosocial lending.

Second, we understand the influence of lending experience on lender retention from the competence dimension in SDT. This important factor in the lending experience set for lender retention is feedback. Positive feedback links with a sense of accomplishment, enhancing intrinsic motivation (Burgers *et al.*, 2015; Merchant *et al.*, 2010), while negative feedback is accompanied by a decrease in intrinsic motivation. A loan is posted on the online prosocial lending platform after the necessary preparation and can end with one of two statuses: funded or expired. If a loan is funded, the lender can feel that their lending is valuable and then continuously behave in the same way. In contrast, an expired loan is a negative feedback in identifying outstanding projects, weakening the lender's psychological need and competence (Vallerand and Reid, 1984), which indicates that the lender cannot be competent in this kind of prosocial activity (Chen and Jang, 2010). Previous studies have found that investors who tend to quit have a lower success rate in their investment than those who have a continuous investment (Liao *et al.*, 2017; Zakhlebin and Horvát, 2019). Particularly, we find that the repayment rates for a few online prosocial lending platforms are over 94%, such as Kiva and Rang De (Ravishankar, 2021), indicating that the funded lending experience can make a bigger impact on the lender's retention decision. So, we hypothesize that:

H1b. The negative project feedback is negatively related to lender retention in online prosocial lending.

Third, we understand the influence of the lender's social connection on lender retention from the relatedness dimension in SDT. Many studies have used the individuals' social connection to represent the relatedness dimension in SDT (Berezan *et al.*, 2018; Li *et al.*, 2017). The lender's social connection plays an important role in online prosocial lending (Chen *et al.*, 2017). One of the most significant benefits is the relatedness experiences in prosocial behavior (Pavey *et al.*, 2011). Lenders gain a sense of belonging when connecting with others, which leads to an increase in intrinsic motivation. For example, when playing with others and receiving more attention from users around them, people can feel more satisfied. Similar to the general online crowdfunding context, in the online prosocial lending context, lenders can acquire a sense of lender-related honor for the relatedness, which grows with the increasing number of their friends on the platform (Lin *et al.*, 2013); and lenders create friendships by sending an invitation link. Therefore, we hypothesize that:

H2a. The signal that lenders are invited by their friends is positively related to lender retention in online prosocial lending.

H2b. The signal that lenders invite more friends is positively related to lender retention in online prosocial lending.

Lenders are more likely to contribute to a project with like-minded people (Gerber and Hui, 2013). Additionally, lenders are encouraged to join or create lending teams on the online prosocial lending platform, and everyone can choose to be a part of their appreciated team. Previous studies have confirmed that the lender tends to lend more when joining a lending team (Chen *et al.*, 2017). Different lending teams are competing with each other, and lending teams are ranked by the total amount of lending. The competition among lending teams strengthens the bonds among team members and increases the feeling of relatedness (Ai *et al.*, 2016). As a result, the number of lending teams that the lender has joined can influence their retention behavior. Many lurkers (Cranefield *et al.*, 2015) awake due to the team competition, and the size of the lending team will increase team members' lending activities (Ai *et al.*, 2016; Chen *et al.*, 2017). More members of the lending team mean more connections with others. Therefore, we hypothesize that:

H2c. The number of lending teams that the lender has joined is positively related to lender retention in online prosocial lending.

H2d. Average lending team size is positively related to lender retention in online prosocial lending.

The disclosure of lending motivations is important in the context of online prosocial lending and they usually vary among users (Song *et al.*, 2016). What is more, according to Song *et al.* (2016), self-disclosure could promote online prosocial behaviors. In addition, Liu *et al.* (2014) have mapped these motivations into the SDT taxonomy of motivations. From the cognitive perspective, disclosure of lending motivations could decrease the consumption of cognitive resources, then promote helping and prosocial behaviors which need cognitive control because people have selfless motivations (Zhao *et al.*, 2020). With strong prosocial motivations, a shared vision and trust among the users on the online prosocial lending platform will form easily (Chen *et al.*, 2016). Therefore, users will have stronger autonomy in online prosocial lending behavior. Accordingly, not only the negative influence led by negative project feedback could be weakened, but also the negative influence led by the degree of profit language in the loan description text in the last lending experience could be weakened. Overall, the negative influence on lender retention led by lending experience could be weakened in this condition.

As for the lender's social connection, the self-disclosure behavior reflects the neuroticism of users in the perceived social support perspective, which represents users' tendency to experience negative emotional states (Chen *et al.*, 2016). Therefore, negative emotional states will usually occur in the social connection condition (Cheung *et al.*, 2015). Accordingly, the negative influence on lender retention led by the lender's social connection could be strengthened for the users with disclosure of lending motivations. As for the positive influence led by the lender's social connection, individuals who have a higher level of neuroticism reported a lower level of perceived social support in the online environment (Chen *et al.*, 2016). Therefore, the positive influence on lender retention led by the lender's social connection could be weakened for the users with disclosure of lending motivations. In our study, we focus on whether the lender discloses the statement "I loan because" and we hypothesize that:

H3. **(Moderating effects):** The disclosure of lending motivation moderates the effects of both the lender's lending experience and social connection on lender retention. Specifically, the **negative effects of lending experience** are weakened for lenders who disclose motivations for a loan than for those who do not; the **negative effects of the lender's social connection** are strengthened for lenders who disclose motivations for a loan than for those who do not; the **positive effects of the lender's social connection** are weakened for lenders who disclose motivations for a loan than those who do not.

3. Method

3.1 Context and data

In this study, the data was collected from Kiva, an ideal context for the online prosocial lending platform for our study. Founded in 2005, Kiva is one of the largest online microfinancing platforms for online prosocial lending around the world, with the mission to "connect people through lending to alleviate poverty." By May 20, 2020, Kiva had achieved $1.4 billion in loans to 1.9 million entrepreneurs from 77 different countries [2]. The loan requests are posted after the necessary screening, and essential project information should be provided. Then, individuals from all over the world can contribute as little as $25 to a loan to support the entrepreneur to start a business, and every dollar can be sent to the borrower with no commission fee for the platform. Importantly, Kiva's lenders can take back the principal but no interest or a reward for funding, with a prosocial agenda to help others. The borrower can receive the funds only if the goal is reached before the funding deadline, namely, "all or nothing." Particularly, Kiva has implemented various mechanisms to promote lender retention, such as the inviting mechanism and the lending team program.

Our dataset is between August 2005 and August 2017. The raw data includes information about lenders, loans and lending teams. Lenders can enter or leave the platform at any time. To observe lender retention, we set a point in time of observation and then determine the activity window and retention window. As displayed in Figure 2, we set March 2017 as the point in time. We set the retention window to 6 months, and we set the activity window to 12 months. After dropping lenders who entered the platform during the retention window or had no activity in the activity window and those with incomplete information, our sample contains 382,100 lenders for final empirical analysis. Furthermore, to obtain the features of these lenders like the number of the lending teams they have joined, we set August 2005 to March 2017 as the features window to calculate corresponding features.

3.2 Measures

Our measures will be illustrated in this section. All variables and their descriptions are shown in Table 2.

3.2.1 Dependent variables. *Retention*, measured as lender retention, is the dependent variable, which is a dummy variable with the value of 1 when the lender has at least one lending during the retention window and 0 otherwise. Another variable, *Time*, refers to the time interval in months between the last lending in the activity window and the first lending in the retention window, which is used for the Cox regression. In addition, we used *LendingNum*, which denotes the number of loans the lender has made during the retention window, this is a variable for our robustness checks.

3.2.2 Independent variables. Regarding H1a, we used *ProfitLanguageRatio*, measured as experienced profit language, to denote the ratio of profitability keywords in the last loan's description, which is provided by the project initiators (Jancenelle *et al.*, 2018). Some previous studies have found that the last project description affects the next lending or investment in the context of crowdfunding (Zakhlebin and Horvát, 2019; Zhao *et al.*, 2020). Specifically, the keywords related to external profitability in the loan description are accompanied by

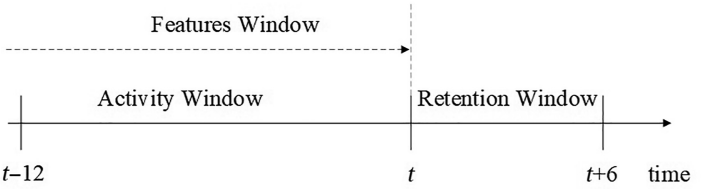

Figure 2.
An illustration of the time setting

the possibility of receiving a return (Berns *et al.*, 2020; Zhang and Chen, 2019). Accordingly, the profit language in our study examines the family business profitability (Zachary *et al.*, 2011) and includes keywords that have been adopted to measure profitability by prior studies in the context of online prosocial lending (Allision *et al.*, 2015; Du *et al.*, 2021; Jancenelle *et al.*, 2018), such as benefit, productivity and profit. All the keywords are shown in Appendix 1. To test H1b, we introduced the variable, *ExpiredNum*, measured as the expired number in Figure 1, which is the number of expired loans the lender made. *ProfitLanguageRatio* and *ExpiredNum* describe the lending experience of lenders on the online prosocial lending platforms.

Next, we used four variables to represent the lender's social connection. In terms of lenders, we chose two variables, *Invitee* and *LendersInvitedNum*. *Invitee* is a dummy variable with the value of 1 when the lender registers through a friend's invitation link and 0 when the lender searches the registration page independently and sets up an account. Every lender can share an invitation link with their friends through email or social media platforms like Facebook and Twitter. Their friends can create a Kiva account through this invitation link. We used the variable *LendersInvitedNum* to refer to the number of friends the lender has invited. In terms of lending teams, we chose two variables, *TeamJoinedNum* and *AvgTeamMember*. *TeamJoinedNum* refers to the number of the lending teams the lender has joined, and *AvgTeamMember* represents the average number of members in those teams. *Invitee*, *LendersInvitedNum*, *TeamJoinedNum* and *AvgTeamMember* describe the lender's social connection on the online prosocial lending platforms.

3.2.3 Moderating variable. To test the moderating effects, we extracted the moderating variable *DisclosureofMotivation* from the raw data. *DisclosureofMotivation* is a dummy

Variables	Descriptions
Dependent variables	
Retention	A dummy variable, 1 if the lender has any lending during the retention window, 0 otherwise
Time	The time interval in months between the last lending in the activity window and the next lending in the retention window
LendingNum	The number of loans the lender has participated in during the retention window
Independent variables	
Lending Experience	
ProfitLanguageRatio	The ratio of profitability keywords in the loan's description in the last lending
ExpiredNum	The number of expired loans the lender has participated in during the activity window
Social Connection	
Invitee	A dummy variable, 1 if the lender creates an account through an invitation link from his or her friend, 0 otherwise
LendersInvitedNum	The number of friends the lender has invited
TeamJoinedNum	The number of teams the lender has joined
AvgTeamMember	The average number of members of the lending teams the lender has joined
Moderating variable	
DisclosureofMotivation	A dummy variable, 1 if the lender discloses his or her lending motivation for lending with the text of "I loan because" when they register on the platform, 0 otherwise
Control variables	
Country	A dummy variable, 1 if the lender discloses his or her country, 0 otherwise
Duration	The time length since the lender comes to the platform
HistoricalLendingNum	The number of loans the lender has participated in during the activity window

Table 2. Variables and their descriptions

variable with the value of 1 representing the lender discloses their lending motivations for lending on Kiva and 0 otherwise. Specifically, when lenders register on the site, they have the option to fill in a field labeled "I loan because . . .," thus, we used whether there is the "I loan because . . .." to measure the moderating variable.

3.2.4 Control variables. We extracted three variables concerning the lender's characteristics. First, we controlled whether the lender discloses their personal information on *Country*, a dummy variable with the value of 1 representing the lender has disclosed where he/she comes from and 0 otherwise. In addition, *Duration* represents the time length the lender has stayed on Kiva in months, and *HistoricalLendingNum* refers to the lender's historical behaviors.

4. Empirical designs

To test the effect of the lender's lending experience and social connection on lender retention, we estimated a logistic regression model:

$$P(Retention = 1|X_i) = \beta_0 + \beta_1 ProfitLanguageRatio_i + \beta_2 ExpiredNum_i + \beta_3 Invitee_i + \beta_4 lnLendersInvitedNum_i + \beta_5 lnTeamJoinedNum_i + \beta_6 lnAvgTeamMember_i + \beta_7 ControlVar_i + \epsilon_i$$

In this model, *Retention* is a dummy variable that takes the value of 1 if the i^{th} lender is retained during the retention window, and 0 otherwise; the variables that represent the lender's lending experience include $ProfitLanguageRatio_i$ and $ExpiredNum_i$; the variables that represent the lender's social connection include $Invitee_i$, $LendersInvitedNum_i$, $TeamJoinedNum_i$ and $AvgTeamMember_i$. As for the $LendersInvitedNum_i$, $TeamJoinedNum_i$ and $AvgTeamMember_i$, we took the logarithm of them because of their wide value range of variation. $ControlVar_i$ is a vector variable in the model that reflects characteristics of the ith lender, including *Country*, *Duration* and *HistoricalLendingNum*, which are introduced in Section 3.2. ε_i is the error of this model. Then, to test the moderating effects of disclosure of lending motivation on the lender's lending experience and lender retention, and the moderating effects of disclosure of lending motivation on the lender's social connection and lender retention, we also estimated a logistic regression model:

$$\begin{aligned} P'(Retention = 1|X_i) = {} & \beta'_0 + \beta'_1 ProfitLanguageRatio_i + \beta'_2 ExpiredNum_i + \beta'_3 Invitee_i \\ & + \beta'_4 lnLendersInvitedNum_i + \beta'_5 lnTeamJoinedNum_i \\ & + \beta'_6 lnAvgTeamMember_i \\ & + \beta'_7 DisclosureofMotivation_i{*}ProfitLanguageRatio_i \\ & + \beta'_8 DisclosureofMotivation_i{*}ExpiredNum_i \\ & + \beta'_9 DisclosureofMotivation_i{*}Invitee_i \\ & + \beta'_{10} DisclosureofMotivation_i{*}lnLendersInvitedNum_i \\ & + \beta'_{11} DisclosureofMotivation_i{*}lnTeamJoinedNum_i \\ & + \beta'_{12} DisclosureofMotivation_i{*}lnAvgTeamMember_i \\ & + \beta'_{13} DisclosureofMotivation_i + \beta'_{14} ControlVar_i + \varepsilon'_i \end{aligned}$$

In addition to the dependent, independent and control variables explained in the last model, the moderating variable is $DisclosureofMotivation_i$, which is a dummy variable that takes the value

of 1 if the ith lender discloses his or her motivation for lending in the text of "I loan because . . ." when the lender registers on the platform, 0 otherwise. ε_i' is the error of this model.

5. Results

In this section, we show the empirical results. Before conducting the regression analyses, some variables, such as *LendingNum*, *ExpiredNum* and *LendersInvitedNum*, have some outliers and we eliminated those. Specifically, we eliminated 0.1% of the largest *ExpiredNum*, *LendersInvitedNum* and *TeamJoinedNum*, and 0.05% of the largest *LendingNum*. Finally, we had 381,719 observations, 53% remained lenders, while the other 47% were considered to be churn. Descriptive statistics for all variables are shown in Table 3 and pairwise correlations are shown in Table 4. We observed that the correlations among our variables are generally low. To evaluate the limited influence of the correlations among all variables on the empirical results, we constructed the variance-inflation-factor (VIF) test. In the results, the greatest VIF observed for the sample was 3.61 (N = 381,719), which was significantly below 10 (the maximum suggested level for regression analysis; e.g. Hair *et al.*, 2010). This could confirm that there is almost no multicollinearity among all variables in the empirical setting.

5.1 Main results

The results of regression models are shown in Table 5. Model 1 only covers the control variables. In Models 2–4, we test the hypotheses separately. Model 5 includes all variables; it shows that all variables have significant influences.

Hypotheses 1a and 1b propose the influence of lenders' lending experience. Hypothesis 1a states that the degree of experienced profit language is negatively associated with lender retention in the context of online prosocial lending. From Model 2 of Table 5, we find that *ProfitLanguageRatio* has a significantly negative effect ($\beta = -1.345$; $p < 0.01$), which provides support for hypothesis 1a. This result means that, when the last loan's description contains more profit language, weakening the satisfaction of autonomy, the lender is less likely to relend. Thus, hypothesis 1a is supported.

Hypothesis 1b suggests that the negative feedback from participation is negatively related to lender retention in the context of online prosocial lending. We find support from Model 3 of Table 5, which shows that the effect of *ExpiredNum* is significantly negative ($\beta = -0.025$; $p < 0.01$). An expired loan means the loan failed to raise the request fund by the deadline. The greater the number of expired loans is, the more likely lenders are to elapse in

Table 3. Descriptive statistics

Variables	Max	Min	Mean	SD
Retention	1	0	0.525	0.499
Time	124	0	6.805	3.540
LendingNum	229	0	2.419	8.530
ProfitLanguageRatio	1	0	0.023	0.030
ExpiredNum	38	0	0.269	1.303
Invitee	1	0	0.382	0.486
LendersInvitedNum	22	0	0.490	1.401
TeamJoinedNum	12	0	0.530	0.847
AvgTeamMember	166,856	0	15196.220	36247.560
DisclosureofMotivation	1	0	0.164	0.370
Country	1	0	0.531	0.499
Duration	133	1	55.481	38.478
HistoricalLendingNum	34,018	1	8.308	103.442

Table 4.
Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) *Retention*	1.000												
(2) *Time*	−0.539*	1.000											
(3) *LendingNum*	0.270*	−0.345*	1.000										
(4) *ProfitLanguageRatio*	−0.033*	0.014*	−0.006*	1.000									
(5) *ExpiredNum*	0.124*	−0.228*	0.549*	−0.003*	1.000								
(6) *Invitee*	−0.098*	0.225*	−0.080*	−0.024*	−0.058*	1.000							
(7) *LendersInvitedNum*	0.135*	−0.173*	0.147*	−0.005*	0.099*	−0.079*	1.000						
(8) *TeamJoinedNum*	0.057*	−0.049*	0.135*	−0.013*	0.110*	0.073*	0.152*	1.000					
(9) *AvgTeamMember*	−0.143*	0.314*	−0.019*	−0.066*	−0.009*	0.428*	−0.002	0.016*	1.000				
(10) *DisclosureofMotivation*	0.146*	−0.180*	0.138*	−0.006*	0.100*	−0.157*	0.209*	0.165*	−0.132*	1.000			
(11) *Country*	0.205*	−0.226*	0.121*	−0.014*	0.087*	−0.266*	0.208*	0.080*	−0.243*	0.381*	1.000		
(12) *Duration*	0.232*	−0.232*	0.113*	−0.032*	0.091*	−0.243*	0.246*	−0.021	−0.342*	0.359*	0.593*	1.000	
(13) *HistoricalLendingNum*	0.051*	−0.095*	0.779*	−0.003*	0.477*	−0.021*	0.067*	0.056*	−0.017*	0.048*	0.033*	0.032*	1.000

Note(s): * Showing significance at the 5% level

Variables	(1)	(2)	(3)	(4)	(5)
ProfitLanguageRatio		−1.345***			−1.520***
		(0.127)			(0.129)
ExpiredNum			−0.025***		−0.029***
			(0.006)		(0.006)
Invitee				−0.099***	−0.101***
				(0.008)	(0.008)
lnLendersInvitedNum				0.182***	0.182***
				(0.009)	(0.009)
lnTeamJoinedNum				0.285***	0.291***
				(0.018)	(0.018)
lnAvgTeamMember				−0.034***	−0.035***
				(0.002)	(0.002)
Country	0.161***	0.160***	0.085***	0.160***	0.086***
	(0.008)	(0.008)	(0.009)	(0.008)	(0.009)
lnDuration	0.313***	0.314***	0.287***	0.314***	0.285***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
lnHistoricalLendingNum	0.830***	0.838***	0.817***	0.830***	0.826***
	(0.004)	(0.005)	(0.005)	(0.004)	(0.005)
_cons	−1.853***	−1.890***	−1.716***	−1.888***	−1.674***
	(0.012)	(0.012)	(0.013)	(0.012)	(0.013)
Obs	381,719	381,719	381,719	381,719	381,719
Pseudo R^2	0.153	0.153	0.155	0.153	0.155

Note(s): Standard errors are in parenthesis. ***, ** and *, respectively, indicate significance at the 1%, 5% and 10% levels

Table 5. Main results

the context of online prosocial lending. Thus, hypothesis 1b is supported. Overall, the factors of the lender's lending experience play an important role in lender retention.

Regarding the relatedness, we propose that a greater degree of social connection is positively associated with a greater likelihood of lender retention. From Model 4 of Table 5, we find that the four variables are significantly related to lender retention. However, we obtain different results. In the aspect of lenders, *LendersInvitedNum* shows a positive effect on lender retention ($\beta = 0.182$; $p < 0.01$), while *Invitee* has a negative effect ($\beta = -0.099$; $p < 0.01$). The positive effect of *LendersInvitedNum* means that, when the lender invites more friends to enter this platform, he/she has a stronger connection with the platform and tends to relend. In the meantime, sharing the invitation link also manifests a commitment and an intention to remain on this platform. Hypothesis 2b is supported. However, the negative effect of *Invitee* indicates that lenders who are invited by friends are more likely to churn than lenders who search the website by themselves. An interesting phenomenon is that lenders who are invited by friends seem to show less loyalty toward the platform and are more inclined to stop lending (Althoff and Leskovec, 2015), while lenders who invite more friends have a stronger stickiness to the platform. Hypothesis 2a is not supported.

In the aspect of lending teams, *TeamJoinedNum* has a positive coefficient ($\beta = 0.285$; $p < 0.01$), while the coefficient of *AvgTeamMember* is negative ($\beta = -0.034$; $p < 0.01$). When the lender joins more lending teams, he/she is more likely to relend and lend together with the team members to achieve the team goals. So, the more lending teams the lender joins, the more likely they are to remain on the online prosocial lending platform. The negative effect of *AvgTeamMember* means that the lender may show more negative behaviors when he/she is in a large team. In a big-size team, the lender may refuse to contribute more to the team and expect to share the outcomes of others due to social loafing. Thus, hypothesis 2c is supported, while hypothesis 2d is not

supported. To evaluate the social loafing phenomenon empirically, we further explored the effect of different team sizes on lender retention, and the analysis is presented in Section 5.3.

As for the control variables, the results in Models 1 and 5 of Table 5 are consistent and give some interesting findings. The variable *Country* is positively related to lender retention ($\beta = 0.086$; $p < 0.01$). A lender who shares more personal information such as nationality expresses a higher likelihood to lend again. *Duration* is positively related to lender retention ($\beta = 0.285$; $p < 0.01$). So, it is found that early lenders are more likely to lend again. *HistoricalLendingNum* is also positively associated with lender retention ($\beta = 0.826$; $p < 0.01$). Thus, the historical lending number is an effective signal for lender retention.

5.2 Moderating effects

In this part, we test the moderating effects of disclosure of lending motivation. The results are shown in Table 6. In Model 1, we test the moderating effect of the variable *DisclosureofMotivation* on lender retention. In Models 2–4, we separately add interaction terms between an independent variable and the moderating variable according to our hypotheses. Model 5 includes all variables and shows the overall effects. Model 1 shows that the coefficient of *DisclosureofMotivation* is significantly positive ($\beta = 0.076$; $p < 0.01$), indicating that the lender who has autonomous motivations is more likely to remain. From Models 2 and 3, the results of *ProfitLanguageRatio* and *ExpiredNum* are consistent with those in Table 5; meanwhile, the interaction terms are significantly negative. The results suggest that *DisclosureofMotivation* moderates the negative effects between the lender's lending experience and lender retention. As seen from Model 4, the coefficients of the interaction terms, which are *Invitee* and *AvgTeamMember*, are significantly positive, meaning that the negative effects led by the lender's social connection are strengthened by the disclosure. Meanwhile, the coefficients of the interaction terms, which are *LendersInvitedNum* and *TeamJoinedNum*, are significantly negative, meaning that the positive effects led by the lender's social connection are weakened by the disclosure. Thus, H3 is supported.

5.3 Additional analysis

From Section 5.1, we know that the number of lending teams that lenders have joined has a positive effect on lender retention while the average number of team members has a negative effect, which is inconsistent with hypothesis 2d. This phenomenon indicates that social loafing or the free-rider problem led by the larger and larger team size cannot be ignored (Jiang *et al.*, 2019; Zhao *et al.*, 2022b). To further evaluate the phenomenon, we set a threshold value for team size: if the size of the lending team is more than the threshold value, we categorized it into the big team, otherwise the small team. Specifically, we set four different thresholds, comprising 100, 20, 8 and 4. We further extracted the number of big teams and small teams lenders have joined based on these thresholds, such as *BigTeam_100* and *SmallTeam_100*. All the results are presented in Table 7. From Models 1–4, we see that the number of big teams has a significantly negative effect, while the number of small teams shows a significantly positive effect. The results are consistent in different threshold values. These results indicate that joining a small size team where lenders can get a stronger feeling of relatedness can facilitate lasting lending, while joining a big size team decreases lasting lending.

5.4 Robustness checks

We verified the robustness of our main results. First, we used *LendingNum*, which refers to the number of loans the lender has participated in during the retention window as an alternative measure of lender retention. *LendingNum* is a count variable and we conducted a Poisson regression analysis. The results in Table 8 are generally in accordance with our main results in

Table 6. Results of the moderating effects

Variables	(1)	(2)	(3)	(4)	(5)
ProfitLanguageRatio		−1.170*** (0.129)			−1.362*** (0.131)
ExpiredNum			−0.010 (0.007)		−0.017** (0.009)
Invitee				−0.112*** (0.009)	−0.114*** (0.009)
lnLendersInvitedNum				0.211*** (0.021)	0.211*** (0.010)
lnTeamJoinedNum				0.331*** (0.021)	0.335*** (0.021)
lnAvgTeamMember				−0.038*** (0.002)	−0.039*** (0.002)
*DisclosureofMotivation*ProfitLanguageRatio*		−0.017*** (0.003)			−0.016*** (0.003)
*DisclosureofMotivation*ExpiredNum*			−0.036*** (0.010)		−0.028*** (0.010)
*DisclosureofMotivation*Invitee*				0.170*** (0.024)	0.168*** (0.024)
*DisclosureofMotivation*lnLendersInvitedNum*				−0.103*** (0.019)	−0.102*** (0.019)
*DisclosureofMotivation*lnTeamJoinedNum*				−0.244*** (0.040)	−0.238*** (0.040)
*DisclosureofMotivation*lnAvgTeamMember*				0.035*** (0.005)	0.036*** (0.005)
DisclosureofMotivation	0.076*** (0.011)	0.137*** (0.015)	0.084*** (0.011)	0.010 (0.016)	0.070*** (0.019)
Country	0.143*** (0.009)	0.144*** (0.009)	0.143*** (0.009)	0.070*** (0.009)	0.071*** (0.009)
lnDuration	0.312*** (0.004)	0.311*** (0.004)	0.311*** (0.004)	0.285*** (0.004)	0.283*** (0.004)
lnHistoricalLendingNum	0.828*** (0.004)	0.827*** (0.004)	0.835*** (0.004)	0.816*** (0.005)	0.823*** (0.005)
_cons	−1.880*** (0.012)	−1.849*** (0.012)	−1.883*** (0.012)	−1.701*** (0.013)	−1.664*** (0.014)
Obs	381,719	381,719	381,719	381,719	381,719
Pseudo R^2	0.153	0.154	0.153	0.156	0.156

Note(s): Standard errors are in parenthesis. ***, ** and *, respectively, indicate significance at the 1%, 5% and 10% levels

Variables	(1)	(2)	(3)	(4)
ProfitLanguageRatio	−3.399***	−3.392***	−3.391***	−0.1507***
	(0.161)	(0.161)	(0.161)	(0.128)
ExpiredNum	−0.001**	−0.001**	−0.001**	−0.001**
	(0.000)	(0.000)	(0.000)	(0.000)
Invitee	−0.143***	−0.145***	−0.146***	−0.102***
	(0.008)	(0.008)	(0.008)	(0.008)
lnLendersInvitedNum	0.196***	0.196***	0.196***	0.176***
	(0.008)	(0.008)	(0.008)	(0.008)
BigTeam_100	−0.023***			
	(0.004)			
SmallTeam_100	0.001***			
	(0.000)			
BigTeam_20		−0.011***		
		(0.003)		
SmallTeam_20		0.002**		
		(0.001)		
BigTeam_8			−0.009***	
			(0.003)	
SmallTeam_8			0.004**	
			(0.002)	
BigTeam_4				−0.016***
				(0.004)
SmallTeam_4				0.021**
				(0.009)
Country	0.099***	0.098***	0.098***	0.098***
	(0.009)	(0.009)	(0.009)	(0.009)
lnDuration	0.297***	0.298***	0.299***	0.286***
	(0.004)	(0.004)	(0.004)	(0.004)
lnHistoricalLendingNum	0.819***	0.818***	0.818***	0.817***
	(0.004)	(0.004)	(0.004)	(0.004)
_cons	−1.684***	−1.690***	−1.691***	−1.655***
	(0.013)	(0.013)	(0.013)	(0.013)
Obs	381,179	381,179	381,179	381,179
Pseudo R^2	0.156	0.156	0.156	0.156

Note(s): Model 1 incorporates the variables *BigTeam_100* and *SmallTeam_100*, where the threshold value is 100. Model 2 incorporates the variables *BigTeam_20* and *SmallTeam_20*, where the threshold value is 20. Model 3 incorporates the variables *BigTeam_8* and *SmallTeam_8*, where the threshold value is 8. Model 4 incorporates the variables *BigTeam_4* and *SmallTeam_4*, where the threshold value is 4; Standard errors are in parenthesis. ***, ** and *, respectively, indicate significance at the 1%, 5% and 10% levels

Table 7.
Results of the additional analysis

Table 5. Second, we carried out a survival analysis using the Cox regression model. The Cox regression model can take both lender retention and survival time as the dependent variables and analyze the influence of factors on survival time without losing the observations of lost lenders. We used the variable *Time* as the survival time, which is the time interval in months until the lender makes lend in the retention window. The Cox regression results are shown in Table 9, which are still consistent with our main results, showing the robustness of our findings.

6. Discussion

6.1 Main findings

Online prosocial lending, as a new form of crowdfunding, has aroused wide attention. It is non-profit and mostly motivated by altruistic reasons (Gerber and Hui, 2013). Although there are a lot of studies about the motivations and decision-making of online prosocial lending

Variables	(1)	(2)	(3)	(4)	(5)
ProfitLanguageRatio		−1.345***			−0.152***
		(0.127)			(0.129)
ExpiredNum			−0.025***		−0.029***
			(0.006)		(0.006)
Invitee				−0.099***	−0.101***
				(0.008)	(0.008)
lnLendersInvitedNum				0.182***	0.182***
				(0.009)	(0.008)
lnTeamJoinedNum				0.285***	0.291***
				(0.018)	(0.018)
lnAvgTeamMember				−0.034***	−0.035***
				(0.002)	(0.002)
Country	0.160***	0.161***	0.160***	0.085***	0.860***
	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)
lnDuration	0.314***	0.313***	0.314***	0.287***	0.285***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
lnHistoricalLendingNum	0.830***	0.830***	0.838***	0.817***	0.826***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
_cons	−1.888***	−1.853***	−1.890***	−1.716***	−1.674***
	(0.012)	(0.012)	(0.012)	(0.013)	(0.013)
Obs	382,100	382,100	381,179	382,100	381,179
Pseudo R^2	0.772	0.772	0.772	0.773	0.773

Note(s): Standard errors are in parenthesis. ***, ** and *, respectively, indicate significance at the 1%, 5% and 10% levels

Table 8. Robustness check: the Poisson regression

Variables	(1)	(2)	(3)	(4)	(5)
ProfitLanguageRatio		−1.393***			−1.623***
		(0.108)			(0.001)
ExpiredNum			−0.065***		−0.071***
			(0.002)		(0.002)
Invitee				−0.120***	−0.120***
				(0.005)	(0.005)
lnLendersInvitedNum				0.090***	0.090***
				(0.005)	(0.005)
lnTeamJoinedNum				0.120***	0.172***
				(0.009)	(0.009)
lnAvgTeamMember				−0.032***	−0.037***
				(0.001)	(0.001)
Country	0.136***	0.136***	0.133***	0.081***	0.075***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
lnDuration	0.203***	0.203***	0.197***	0.160***	0.150***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
lnHistoricalLendingNum	0.654***	0.654***	0.707***	0.649***	0.702***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Obs	364,638	364,638	364,638	364,638	364,638
Pseudo R^2	0.023	0.023	0.023	0.023	0.024

Note(s): Standard errors are in parenthesis. ***, ** and *, respectively, indicate significance at the 1%, 5% and 10% levels

Table 9. Robustness check: the Cox regression

(Burtch *et al.*, 2014; Galak *et al.*, 2011), our knowledge remains scant regarding the mechanism of lender retention. This paper contributes to online prosocial lending and online philanthropy by conducting a study of lender retention. Our research analyzes the

antecedents of lender retention for online prosocial lending from a self-determination perspective.

This study provides evidence that the retention decision of online prosocial lending can be influenced by both the lender's lending experience and the lender's social connection, and they represent self-determination with financial and prosocial motives. First, our findings show that the lender's lending experience plays an important role in lender retention. From the autonomy dimension, lender retention is negatively associated with the ratio of profit language included in the entrepreneurs' narratives of the last loan. A high ratio of profitability language can lead to an external locus of causality and a decrease in the lender's self-determination, thus lowering lender retention. From the competence dimension, our results suggest that the negative feedback from loans can have an adverse effect on lender retention. A failure of investment makes it impossible for a lender to help the people who need help, reducing their feeling of the value and significance of the platform. Therefore, the full funding of a loan is of importance to both the current loan and the retention of participating lenders.

Second, our results indicate that not all social interpersonal relatedness can facilitate lender retention in the context of online prosocial lending. When lenders invite more friends to participate in loans, they show more of a sense of identity and a high degree of self-determination. When lenders join more lending teams, they feel more connected with the task of lending. The satisfaction of the relatedness can further promote lender retention in the context of online prosocial lending. However, in our analysis, we find that the lender who is invited shows a lower likelihood of retention, indicating that the invitee does not show more commitment to the platform (Althoff and Leskovec, 2015). In our research, lenders who register by themselves may have more intrinsic motivations to relend, whereas lenders who register via their friends may just help their friends and they have less intrinsic motivations to lend again (Deci and Ryan, 2000). In addition, our findings show that the average number of team members of the lending teams that lenders have joined is negatively related to lender retention, which is contrary to our hypothesis. We argue that this is caused by the existence of social loafing in which the average contribution rate of each member decreases as the number of members increases (Jiang *et al.*, 2019; Zhao *et al.*, 2022b). Our additional analysis also supports this finding.

Third, the results show that the disclosure of lending motivation can moderate the relationships between factors of the lender's lending experience, the lender's social connection and lender retention. Specifically, the negative effects led by the lender's lending experience are weakened because the disclosure of motivation reflects more prosocial intention and autonomy in prosocial behavior. Additionally, the negative effects led by the lender's social connection are strengthened and the positive effects are weakened, indicating that lenders with disclosure of lending motivation are more sensitive to the negative effects led by social connection, and they hardly perceive the social support although there are positive effects led by social connection.

6.2 Theoretical implications

Our study has three main contributions. First, it contributes to the online philanthropy literature, which is an advanced information system field (Wei *et al.*, 2021). To our knowledge, this study provides a powerful empirical sight on lender retention of online prosocial lending. Specifically, different from the prior studies focusing on the lending process, we focus on the relending process and empirically investigate the effect of previous experience on lender retention from a self-determination perspective. Meanwhile, from the perspective of lender retention, we reveal how the users' previous behaviors could adapt to self-determination, finding that the lender's lending experience and the lender's social connection both have a significant influence. Meanwhile, self-disclosure behavior could moderate these effects. These findings provide a comprehensive and complete understanding of the phenomenon of participant attrition in online philanthropy.

Second, this study contributes to SDT. We construct the relationships between the lender, the lender's lending-experience factors and self-determination to determine the relending behavior. This is an expansion of SDT applied to the online prosocial lending phenomenon. Different from the cross-sectional factors, we bring the longitudinal dimensions to understand lender retentions' self-determination. At the same time, we add the boundary conditions in the SDT application in lender retention. Furthermore, we examine different levels of the impact of three basic psychological needs on user behavior, which provides deeper insights into the understanding of SDT.

Third, this study makes a contribution to the literature about user retention of online platforms. Although online user retention is receiving growing attention, there are still few studies in the context of online philanthropy with complex financial and prosocial motives, which are even conflicting to some degree. We provide a self-determination perspective to understand it. Moreover, the existing studies on online user retention were conducted through surveys and qualitative studies. Our study expands the research context with real lender context and methodologies with the modeling of secondary data.

6.3 Practical implications

Our findings have practical implications for both participants and platforms in online prosocial lending. First, we recommend that the entrepreneurs' narratives could contain more humanism, current hardship and hope for the future rather than too much profit language, such as profit, reward, or earning. This could increase lending recurrence and promote the prosperity of online platforms. Second, to ensure the success of a loan project, the online microfinancing platform can make the funding, which has been raised during the fundraising period, available to the borrower, which means not "all or nothing." Third, it is effective to encourage lenders to invite their friends to join the lending teams. Finally, we suggest that the platform needs to set the maximum team size to strengthen the connections among team members.

6.4 Limitations and future research

Our study has some limitations. First, our data is limited; some lender-related and platform-related characteristics such as gender, age or the lender's career changes could be considered to stabilize the model. Second, our analysis could consider individual differences. In the context of online prosocial lending, lenders who are autonomy-oriented may have a stronger ability to mitigate the impact of external events (Hagger and Chatzisarantis, 2011). Future studies could explore the influence of individual differences on lender retention. Third, we find that the smaller lending teams are better for satisfying the need for relatedness, indicating that the optimal lending team size may be a direction for future study.

7. Conclusion

Online prosocial lending platforms have become a representative form of prosocial crowdfunding. This paper focuses on lender retention of online prosocial lending. Based on SDT, we build a framework to explore the effect of the lender's lending experience and the lender's social connection on lender retention in the context of online prosocial lending. By conducting empirical analyses, we find that both the lender's lending experience and the lender's social connection play key roles in lender retention. Our study has made contributions to the online philanthropy literature by expanding the study of lender retention in the context of online prosocial lending. Moreover, our study has extended SDT by exploring the relationship between longitudinal dimensions and self-determination of individuals and extending it into the relending in the context of online prosocial lending.

Notes

1. https://kiva.org/
2. https://www.kiva.global/annual-reports-and-finances/

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Appendix 1

Profitability keywords: Beneficial, benefit, benefited, benefits, cash, cost effective, cost effectiveness, cost efficient, desirable, desire, desired, earn, earning, earnings, earns, emolument, fecundity, fructuous, fruit, fruitful, fruitfully, fruits, gain, gained, gainful, gaining, gains, generate, generates, generating, generative, income, incomes, lucrative, lucre, money, moneymaking, net income, proceeds, productive, productivity, profit, profit making, profitable, profits, profited, profiting, propitious, prosper, prospered, prospering, prosperous, prospers, return, revenue, reward, rewarded, rewarding, rewards, rich, valuable, value, win, winnings, wins, yield, yielding, yields, paid off, pay off, paid dividends, pay dividends, revenues, bottom line, EBIT, EBITDA, income.

Table A1. The summary of the online prosocial lending research

No.	Source	Perspective	Focus	Independent variables	Theory	Key findings
1	Galak *et al.* (2011)	Lender	Examines the role and the extent of the number of borrowers and social distance in predicting giving in the lab and real decisions made by lenders on Kiva	Borrower group size; social distance (gender, occupation and first name initial)	None	• Lending is less likely as borrower group size increases • Social distance influences lending decisions quite strongly (gender and occupation), and one dimension influences lending decisions to a lesser extent (first name initial)
2	Burtch *et al.* (2014)	Lender	Argues and demonstrates the role of cultural difference and geographic distance in the individuals' selection of a transaction partner on the online prosocial lending platform	Cultural difference; geographic distance; common language; the difference in GDP;	None	• Lenders prefer culturally similar and geographically proximate borrowers • There is a substitution effect between cultural differences and physical distance
3	Allison *et al.* (2015)	Project	Whether, or how, the content of project narratives influences the attractiveness of microloans to investors	Profit language; human interest language; diversity language	Cognitive evaluation theory; SDT	• Lenders respond positively to narratives highlighting the venture as an opportunity to help others, and less positively when the narrative is framed as a business opportunity • The effect of intrinsic cues is stronger than the effect of extrinsic cues in crowdfunding for microfinance

(*continued*)

Table A1.

No.	Source	Perspective	Focus	Independent variables	Theory	Key findings
4	Ai *et al.* (2016)	Lender	Tests which types of team recommendation emails are most likely to get members to join teams, as well as the subsequent impact on lending	Location similarity; history similarity; team size	None	• Emails increase the likelihood that a lender joins a team • Joining a team increases lending in a short window • Lenders are more likely to join teams recommended based on location similarity rather than team status
5	Zhao *et al.* (2020)	Lender	Proposes a joint survival model to predict lending recurrence and lender retention on the online prosocial lending platform	Lender motivation; social contacts; project	None	• The past lending experience of lenders has an important influence on lender retention and lending recurrence
6	Jancenelle *et al.* (2018)	Borrower	Examines how borrower description influences the decision-making process of lenders on the online prosocial lending platform	Economic signaling (bulleter, competitor, coordination, tern focus, profitability); normative signaling (confidence, hope, optimism, resilience)	Signaling theory	• Borrower cues of the bulleter and competitor orientation, long-term focus and focus, confidence and optimism are positively associated with funding time, while cues of coordination, hope, and resilience are negatively associated with funding time • Prosocial lenders appear to lend more quickly to borrowers who demonstrate immediate suffering or concern for others instead of a desire for financial gain

(*continued*)

Table A1.

No.	Source	Perspective	Focus	Independent variables	Theory	Key findings
7	Jancenelle and Javalgi (2018)	Borrower	Adds moral ethics to online prosocial lending crowdfunding by drawing on moral foundations theory	Harm/care; fairness/ reciprocity; ingroup/loyalty; authority/respect; purity/ sanctity	Moral foundations theory	• Prosocial lenders tend to fund borrowers who cue harm/care and fairness/ reciprocity than those who cue ingroup/loyalty, authority/respect, and purity/sanctity
8	Berns *et al.* (2020)	Lender	Examines lenders make lending decisions based on the signals of quality or the idealistic characteristics of the prosocial crowdfunding platform	Financial appeal (strategic): risk rating, loss protection; social appeal (altruistic): badge, narrative	Corporate social responsibility	• Crowdfunding decisions on Kiva tend to be primarily influenced by strategic rather than altruistic motives • Lenders would like to choose high-quality entrepreneurs to ensure their principal return
9	Chung *et al.* (2021)	Project	Examines the impact of the borrowers' stories on the likelihood of speedy and successful funding	Project narratives	None	• Using natural language processing in a bottom-up manner, where the complete narrative is examined for holistically managing information inside the narratives and spontaneously developing storytelling themes without preset categories

(*continued*)

Table A1.

No.	Source	Perspective	Focus	Independent variables	Theory	Key findings
10	Gao *et al.* (2022)	Lender and project	Examines the effectiveness of matching subsidies in shaping funding outcomes and lender behaviors	Matching subsidies	None	• Matching subsidies have a positive effect on matched loans • Matching subsidies makes lenders more likely to contribute • Monetary incentives can increase the total prosocial contributions made to fundraising campaigns
11	Chen *et al.* (2018)	Lender and borrower	Investigates the incentives of lenders and borrowers and how they would choose between the two types of the online prosocial lending platform (Kiva and KivaZip)	Lender: lending utility, altruism; borrower: repayment ability, net gain	None	• Both borrowers and lenders benefit from the advent of peer-to-peer (P2P) direct lending • With the advent of a direct P2P lending platform, the intermediary may reduce its interest rate and increase its screening threshold • The P2P lending platform encourages more altruistic lenders to switch to direct financing

(*continued*)

Table A1.

No.	Source	Perspective	Focus	Independent variables	Theory	Key findings
12	Gama *et al.* (2021)	Lender	Examines the impact of the business-loan purpose (traditional vs. modern) on the success of fundraising campaigns	Modern sector; female; amount requested	Economic development theory	• The modern-sector business loan campaigns accomplish quicker funding than traditional sector campaigns in crowdfunding for microfinance • Although female entrepreneurs still retain an advantage over male entrepreneurs, this advantage weakens in modern sectors, which indicates that lenders pay more attention to high-return ventures than female entrepreneurs
13	Emanuel-Correia *et al.* (2021)	Project	Examines the determinants of fundraising success for loans requested by refugees on a prosocial P2P platform	Refugee entrepreneur; female entrepreneur; past experience	Signaling theory	• Online prosocial lending platforms offer access to finance for refugee entrepreneurs in developing countries, especially refugees with prior borrowing experience • Lenders have discrimination against female refugee entrepreneurs, compared with their non-refugee counterparts in the online prosocial lending platform

(*continued*)

Table A1.

No.	Source	Perspective	Focus	Independent variables	Theory	Key findings
14	Chen *et al.* (2017)	Lender	Investigates the effects of team competition on online prosocial lending activity and explore factors that differentiate successful teams from dormant ones	Joined team; team coordination	None	• Lenders who join teams contribute more than those who do not • Lenders make significantly more loans accessing a goal-setting and coordination message • Goal-setting significantly increases the lending activities of previously inactive teams
15	Luo and Ge (2018)	Lender	Examines whether racial/ethnic discrimination plays the important role in the decision-making process of funders in online prosocial lending	African American borrower; Hispanic borrower; Asian borrower	None	• There is no significant difference in the chance of getting funded for minority loans and White loans • Loans to African Americans have less contribution per funder • The percentage of US funders for African American loans is lower than other loans
16	Moss *et al.* (2018)	Lender	Tests whether prosocial crowdfunding lenders more quickly allocate resources to hybrid microenterprises that communicate their hybridity, or to those that communicate a single one of their dual aims	Social value orientation; economic value orientation	None	• Linguistically positioning a hybrid organizational message in both social and economic categories is less attractive than a single message emphasizing either a social or an economic category

(*continued*)

Table A1.

No.	Source	Perspective	Focus	Independent variables	Theory	Key findings
17	Luo *et al.* (2016)	Lender	Examines the impact of team ranking and team reputation on its lending performance	Reputation (team ranking)	None	• Top-ranked teams have less team lending than teams that do not appear on the top list in subsequent periods • Team-based reputation mechanism tends to be not effective in promoting team identity and increasing online prosocial lending
18	Ravishankar (2021)	Platform	Explores how prosocial P2P lending platforms enact their hybrid orientation (online and offline)	Digital attention-building; digital credibility-building; digital empathy-building	None	• Digital attention-building, digital credibility-building and digital empathy-building relate to the platform's online focus • Intermediary relationship-building and borrower relationship-building relate to its offline focus
19	Wang *et al.* (2019)	Lender and borrower	Examines how borrower-partner and borrower-team event-type ties affect lender behavior and loan success on the online prosocial lending platform	Fundraising goal; the borrower count on the loan; the loan's intended use; the borrower's country	None	• The borrower-team networks work as pipes that facilitate the flow of information and promote lenders from a lending team to the loan page • Borrower-partner ties function as prisms that signal the pressing financial need of borrowers
20	Ge and Luo (2020)	Lender	Investigates how team rivalry affects lending decisions on the online prosocial lending platform	Rival lending	None	• Rival teams would be reluctant to contribute to the same project • The rivalry may encourage members to ignore a fundable project

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