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“I can’t express my thanks enough”: The ‘gratitude cycle’ in online communities

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Abstract

Gratitude is a fundamental aspect of social interaction that positively influences emotional and social wellbeing. It is also crucial for promoting online community health by motivating participation. However, how gratitude occurs and can be encouraged in online communities is not yet well understood. This exploratory study investigates how online community users experience gratitude, focusing on how gratitude expression and acknowledgement occurs, can break down or can be re-enforced. Semi-structured Critical Incident interviews were conducted with eight users of various online communities, including discussion and support groups, social Q&A sites and review sites, eliciting seventeen memorable examples of giving and receiving thanks online. Findings gave rise to a process model of gratitude in online communities - the ‘gratitude cycle,’ which provides a detailed, holistic understanding of the experience of gratitude online that can inform the design of online community platforms that aim to motivate users to perpetuate the cycle. An enriched understanding of gratitude in online communities can help ensure future platforms better support the expression and acknowledgement of thanks, encouraging participation.

Keywords: Gratitude, thanks, prosocial behavior, online community participation

Introduction

Gratitude is a fundamental aspect of social interaction that positively influences emotional and social wellbeing (Bartlett and DeSteno, 2006; Layous et al., 2017). Its social impact is particularly evident in online communities and it plays a crucial role in motivating participation (Yang et al., 2017). As most users observe but do not participate in online communities (Carron-Arthur et al., 2014), gratitude can increase participation and help communities flourish. However, how gratitude expression and acknowledgement occurs in online communities is not yet well understood. Indeed, to our knowledge, no prior research has sought to gain a detailed, holistic understanding of users’ experience of gratitude in online communities. This is important not only for better understanding the nature of online communities and the role that gratitude plays in online communities, but also for understanding how best to design online community platforms to motivate participation through gratitude acknowledgement and expression.

This exploratory study examines how users experience gratitude across online community platforms, focusing on how gratitude expression and acknowledgement occurs, can break down and can be re-enforced. A richer understanding of gratitude in online communities can inform the design of online platforms in ways that extend beyond existing lightweight support, such as ‘like’ or ‘thanks’ buttons and reward points, potentially motivating participation and thereby sustaining community health.

We conducted semi-structured Critical Incident interviews with eight users of various online community platforms, including discussion and support groups, social Q&A sites and review sites and elicited seventeen Critical Incident examples. Based on the findings, we present a process model of gratitude in online communities, the ‘gratitude cycle,’ which provides a detailed description of online gratitude expression and acknowledgement that can inform systems design.

This article is organised as follows: First we review prior related work, mostly from Information Science but also from Positive Psychology and Computer-Mediated Communication. Next, we explain and justify our data collection and analysis approach. Then we present the ‘gratitude cycle,’ explain its stages and potential for breakdown with reference to our interview findings and discuss it in relation to previous work. Finally, we present design guidelines aimed at supporting parts of the model and sustaining the ‘gratitude cycle’.

Background

Most existing gratitude research comes from Positive Psychology: a Psychology sub-discipline focused on the scientific study of human thoughts, feelings and behaviour with a focus on strengths, not weaknesses (Peterson, 2006), or “*what makes life most worth living*” (ibid, p.16). Understanding the cognitive, affective, behavioural and experiential dimensions of gratitude is important for Information Science, as gratitude expression and acknowledgement is key in motivating online community participation (Chang, 2009; Kim and Oh, 2009; Rubenstein, 2009; Mpinganjira, 2017). For example, if a community member is thanked for replying to a question on a social Q&A site, they are more likely to participate further in the community by replying to other questions (Fang et al., 2018), potentially resulting in a (positive) ‘contagion’ of gratitude (Fowler and Christakis, 2010; Tsvetkova and Macy, 2014) and further participation (Raban and Harper, 2008).

Existing work in Computer-Mediated Communication has examined what motivates online community participation; Bishop’s (2006) framework posits that participation is not driven by users’ needs, but their *desires*, which must be consonant with their existing plans, goals, values and beliefs. The online environment must provide opportunity for them to enact these. Specific motivations for participation have been found to include, among others, enjoyment and efficacy (Oh, 2012), learning and social engagement (Syn and Oh, 2015) and status-seeking, which can drive gratitude-related behaviour (Lampel and Bhalla, 2007). Furthermore, recent research in online communities has started to investigate specific aspects of gratitude, such as the types of textual expressions used to express and acknowledge gratitude (Köylü, 2015) and the influence of gratitude on future participation (Feng et al., 2018). However, to our knowledge, no prior research has examined the experience of gratitude in online communities in detail. In this section, we define gratitude and review work that provides insight into its nature, then discuss the related concepts of altruism and reciprocity (including in online communities), then review the limited existing work on gratitude in online communities.

Definition of gratitude

Gratitude involves feeling thankful appreciation for favours or benefits received and happens in response to a positive experience. Its responsive role is highlighted in the Stanford Encyclopedia of Philosophy; “*the proper or called-for response in a beneficiary to benefits or beneficence from a benefactor*” (Manela, 2015). The response is appropriate: the ‘right thing to do.’ It happens in response to something received: tangible or intangible, words or deeds. It is both a “*cognitive and emotional reaction arising from noticing and appreciating the benefits that one has received*” (Wood, 2014).

A ‘benefactor’ performs a kind act to a ‘beneficiary,’ who feels thankful and appreciative in response. The beneficiary may or may not express their gratitude to the benefactor (e.g. by saying thanks) and the benefactor may (or may not) acknowledge the beneficiary’s expression of gratitude. Gratitude is cyclic; a means of showing appreciation for and returning kindness.

Nature of gratitude

Gratitude’s cyclic nature seems almost intuitive; who has not felt the urge to return kindness? However, Positive Psychology research offers a more sophisticated explanation of its attributes and mechanisms. McCullough et al. (2001) identified three functions of gratitude, as: 1) a ‘moral barometer’ encouraging people to recognise others’ kind acts, 2) a ‘moral motivator’ encouraging grateful people to ‘pay it forward’ and 3) a moral re-enforcer’ encouraging people who perform kind acts to do so again. This highlights the ‘gratitude cycle’ is more complex than a loop of kindness, indebtedness and repayment and may involve multiple forward-feeding mechanisms. Several studies support this view; movement within the cycle has a ‘cascade’ or ‘ripple’ effect (Fowler and Christakis, 2010; Layous et al., 2017).

Performing kind acts increases a person’s happiness (McCullough et al., 2001), which in turn increases the amount of effort they put into prosocial behaviour, including performing kind acts for others (Layous et al, 2017). Furthermore, when benefactors are thanked by beneficiaries of their kind

acts, they are more willing to help those beneficiaries again, as they feel greater levels of social worth (Grant and Gino, 2010). This highlights that 1) feeling socially valued is an important outcome of prosocial behaviour and 2) both feeling gratitude and evoking that feeling in others can motivate prosocial behaviour. This helps explain why gratitude “*appears to foster prosocial behaviour among beneficiaries and benefactors alike*” (McCullough et al., 2001, p.263).

Gratitude can drive prosocial behaviour, creating a cascading cycle of kind acts and further gratitude (Fowler and Christakis, 2010; Layous et al., 2017); those who benefit from kind acts are motivated to act kindly to others, who themselves become motivated to perform kind acts (Fowler and Christakis, 2010). The benefactor is also encouraged to perform future kind acts (McCullough et al., 2001). This cycle can build trust and preserve relationships (Bartlett and DeSteno, 2006) and is driven by positive emotion (i.e. when people feel good, they do good). It also promotes positive emotional, physiological and cognitive responses as an outcome. Beneficiaries of kind acts experience a desire to give back to others, or ‘pay it forward’ (McCullough et al., 2001).

As experiences of gratitude vary across individuals and situations (Grant and Gino, 2010; Feng et al., 2018; McCullough et al., 2001), it is understandable that most empirical studies of gratitude (e.g. Bartlett and DeSteno, 2006; Tsvetkova and Macy, 2014; Layous et al., 2017) have been experiment-based - to control potentially confounding individual and contextual factors as far as possible. However, it is difficult to understand gratitude comprehensively through controlled experiments alone. We present an alternative, complementary empirical approach based on participant-selected examples of gratitude. Real examples can provide a rich understanding that embraces the complexity of how gratitude is experienced outside controlled environments.

Relationship to related concepts: Altruism and reciprocity

Kind acts can be motivated by either altruism or reciprocity. With these motivation types, intentions and expectations differ; altruistic acts are performed without expectation of return or reward, reciprocal acts are performed with an expectation that someone will ‘return the favour’ if required. There are two main types of reciprocity; *individual*, where it is the beneficiary who reciprocates, and *collective*, where someone other than the beneficiary (usually another community member) does so (Oh and Syn, 2015). While altruistic kind acts are not influenced by other peoples’ intentions or actions, reciprocal kind acts are (Wu and Korfiatis, 2013). In particular, “*collective reciprocity depends on and emerges from constant interactions with others*” (Wu and Korfiatis, 2013, p.2071). With both individual and collective reciprocity, there is an expectation of mutual long-term benefit. In contrast, altruistic acts are performed entirely for others’ wellbeing, with no expectation of personal gain (Oh and Syn, 2015). These acts can, however, benefit the community by encouraging a positive cycle of prosocial behaviour, essential to communities surviving, and thriving (Raban and Harper, 2008).

Gratitude can result in a chain of ‘paying it forward’ through altruistic behaviour (Nowak and Roch, 2007) or collective reciprocity (Grant and Gino, 2010; Chang et al., 2012). While this chain of prosocial behaviour often involves beneficiaries and benefactors of kind acts performing kind acts for others (Layous et al., 2017), it can also involve other community members, who observe the kind acts of others and are motivated to act kindly themselves (Tsvetkova and Macy, 2014). This is known as *third-party influence*.

Described in relation to gratitude, the selfless nature of a seemingly altruistic act might instil a feeling of gratitude in an individual, which they feel motivated to express. They may want to ‘pay it back’ to the person who performed the kind act (individual reciprocity), or ‘pay it forward’ to others (collective reciprocity). They may have no expectation of recognition or reward (altruism), or some hope of this (reciprocity). This drives an upward spiral of prosocial behaviour, where gratitude is experienced and expressed in a positive cycle.

While gratitude is inherently positive and has not been found to be associated with negative emotionality (Watkins et al., 2006), when there are high reciprocation expectations people feel less grateful and more indebted (Watkins et al., 2006), which can result in negative emotions. Feelings of indebtedness have been associated with guilt and feeling flustered (Watkins et al., 2006), discomfort (Greenberg, 1980) and uneasiness (Greenberg, 1980; Watkins et al., 2006). If a kind act is perceived as an attempt to make oneself look good in front of others, it can invoke negative emotions rather than feelings of gratitude (Tsang, 2006).

Altruism and reciprocity in online communities

No known prior studies have examined in detail how users experience gratitude in online communities. However, the related concepts of altruism and reciprocity have been examined in the context of motivating online participation, which can involve performing kind acts. Altruism and reciprocity motivate participation in online communities, through the inter-linked practices of information and knowledge-sharing (Hew and Hara, 2007; Dantonio et al., 2012; Oh, 2012) and advice and support-giving (Hew and Hara, 2007; Oh and Syn, 2015). Oh and Syn (2015) identified altruism and reciprocity as factors that influenced social Q&A users to share information and provide social support. These factors have also been found to encourage participation in other online community types, e.g. by motivating people to edit Wikipedia articles (Kuznetsov, 2006) and comment on blog posts (Hsu and Lin, 2008).

Several studies of online communities have reported altruistic behaviour (e.g. Hew and Hara, 2007; Oh, 2012; Oh and Syn, 2015). For example, Dantonio et al. (2012) found social media users shared information they encountered serendipitously altruistically. Similarly, Tinto and Ruthven (2016) found sharers of 'happy' information (information that evokes happiness within the sharer) gained pleasure from making others happy. They identified 'gift-giving' as an important ritual, which did not depend on others' reactions to the giving. However, online community participation may not be entirely selfless as benefactors of kind acts often feel socially rewarded (Grant and Gino, 2010).

There is evidence that social Q&A communities promote 'high-effort, low-reward' participation, where the more effort an asker makes to contribute *relative to the benefit they gain*, the more likely the community will return the favour by providing answers (Wu and Korfiatis, 2013). This suggests the seemingly altruistic behaviour of question answering is not unconditional, but "*shaped by a network context in which social exchange is partially governed by the principle of fairness-based selective giving*" (ibid, p.2076). Promise of social reward also makes it difficult to pinpoint contributors' true intentions for participating (i.e. to what extent they expect anything in return). Online altruism is complicated by reward mechanisms such as voting and reward points. Seemingly altruistic motivations might mask a hidden desire for reward. Likewise, reward mechanisms may distort selfless intentions. Similarly, it is possible to initially be motivated by the reward of completing an activity, but to experience the activity's intrinsically interesting properties, transforming extrinsic motivation to intrinsic (Ryan and Deci, 2000).

Reciprocity in online communities is influenced by feelings of gratitude (Belanche et al., 2018; Mpinganjira, 2017). For example, in online health communities, the more members appreciated knowledge gained, the more likely they were to share knowledge themselves (Mpinganjira, 2017), demonstrating collective reciprocity by 'paying it forwards.' Anonymity can both positively and negatively influence reciprocity in online communities; when members perceive themselves as anonymous, they are more willing to reciprocate kind acts. But when reciprocity is a social community norm, anonymity leads to more free-riding or 'leaching' behaviours (Feng and Ye, 2016).

While gratitude can create a feeling of indebtedness in beneficiaries (Chang et al., 2012; Layous et al., 2017), scholars disagree on whether this is likely to encourage future prosocial behaviour, by encouraging individual or collective reciprocity to redress some of the inequity they perceive between knowledge gained versus contributed (Feng and Ye, 2016) or discourage it, because indebtedness is intrinsically negative and may dampen positive feelings associated with gratitude (Chang et al., 2012). Online community users actively avoid indebtedness situations, where they might feel a 'debt of gratitude,' for example by carefully framing offers and requests to manage expectations and offering small tokens of appreciation (Lampinen et al., 2013).

In all these studies, altruism and reciprocity were identified as motivators of prosocial behaviour, including information-sharing and advice-giving. Some also emphasise that altruism and reciprocity can be driven by feelings of gratitude. However, the role of gratitude in the ecosystem of online community participation has not been examined in detail. This is surprising, as while altruism and reciprocity may motivate kind acts, it is feeling and expressing gratitude for those acts that can encourage a cycle of prosocial behaviour with the potential to promote the health of communities.

Gratitude in online communities

Information-sharing and advice-giving are integral to online communities. As these practices can constitute kind acts, and kind acts can engender thankfulness, it follows that gratitude (and the prosocial behaviour that may ensue) is highly important in online communities. Here, we review the little existing work on gratitude in online communities.

Encouraging meaningful participation in online communities is essential for their success. Gratitude has been identified as an intrinsic motivation for answering questions in social Q&A communities (Raban and Harper, 2008) If answerers receive expressions of gratitude, they are not only more likely to answer other questions in the future, but also to provide higher quality answers (Fang et al., 2018). Gratitude is therefore important for both motivating and re-enforcing future prosocial behaviour (Yang et al., 2017).

Gratitude is frequently expressed and acknowledged in online communities, particularly in social Q&A and online support communities; in social Q&A communities, Kim and Oh (2009) examined the relevance criteria questioners used to select the 'best' answer on social Q&A communities. Several example comments expressed gratitude to the answerer before explaining their rationale for selecting that particular answer. Köylü (2015) took a sample of one hundred IMDb movie trivia social Q&A posts (where members asked each other for help identifying movies or actors). She noted the vast majority of posts contained expressions of gratitude from the questioner and most gratitude expressions were acknowledged by the answerer. She found expressions of gratitude did not simply thank the answerer formulaically, but often explained *why* the asker appreciated the kind act and complemented or jokingly teased the answerer. This may reflect attempts to convey deeper gratitude sentiments or to ensure expressions were perceived as sincere by the questioner.

In online support groups, Rubenstein (2009) found breast cancer support posts often took the form of personal narratives and contained advice that others with the condition might benefit from. Replies included expressions of gratitude. Similarly, Chang (2009) conducted a network analysis on an online Taiwanese psychosis support group and noticed several posts expressed gratitude for help or advice given. He identified gratitude as important for sustaining supportive interactions within weak-tie networks, such as discussion groups.

Although gratitude is essential for maintaining the health of online communities, no known prior studies have focused on gaining a detailed, holistic understanding of how gratitude occurs, can break down or can be re-enforced in this context. Furthermore, while there is considerable research on how gratitude unfolds 'in the world', it is unclear whether and how this applies in online environments. It is also unclear how best to design these environments to support gratitude expression and acknowledgement. This research fills these gaps.

Method

Data collection approach

Semi-structured interviews, each lasting around forty-five minutes were conducted with eight users of various online communities, including online discussion and support groups such as Mumsnet (and groups on mainstream social media platforms such as Facebook), social Q&A sites such as Quora and online review sites such as Tripadvisor. Four participants were female, four male and were aged 24-44. A self-selected, purposive sample was recruited via social media and face-to-face from personal contacts. The only eligibility requirement was participants must have a recent, memorable example of giving or receiving gratitude on an online community platform. They did not need to be registered community members or frequent contributors, although almost all were. To promote generalisability, we did not target users of specific online communities and recruited across a variety of online community types. We informed potential participants of our gratitude focus to aid self-selection and to ensure they came to the interview with multiple appropriate, detailed examples. While bias in self-reported accounts cannot be prevented entirely, we tried to minimise it by asking participants to provide as authentic and faithful accounts as possible and to tell us if aspects of their example were difficult to remember.

After initial questions on their definitions of gratitude and prior online community use to build rapport and set context, the main interview followed a Critical Incident approach (Flanagan, 1954), where participants were asked to discuss in detail self-chosen and memorable recent examples of giving or receiving gratitude in online communities. The semi-structured questions centred around eliciting the detail of their examples and included questions such as ‘when/why did you feel grateful or experience someone’s gratitude?’, ‘who was involved?’, ‘what were you/they grateful for?’, ‘what did you think/feel at the time?’, ‘did this have any impact on your future behaviour?’ When we wanted participants to elaborate further on their experiences, we repeated their remarks (as recommended by Flanagan, 1954) to encourage more detail. For example, P4 stated “on Facebook, ‘likes’ are nice but comments mean so much more.” We repeated “comments mean so much more?” and P4 elaborated: “‘like’ is so easy to do, but if someone has taken the time to comment, that feels even better.” We also asked probing questions to elicit further detail (e.g. ‘what exactly happened?’ ‘what happened before/afterwards?’).

Data collection methodology

The Critical Incident Technique (CIT) has been adapted to understand information-related experiences, including everyday life information-seeking (Savolainen, 1995), serendipitous information encountering (Makri and Blandford, 2012) and public library use (Wong, 2013). This aligns with Flanagan’s aim to provide a flexible rather than prescriptive set of principles. In Information Science, the CIT has mostly been used to frame interviews (rather than observations) and to elicit memorable examples (rather than ‘extreme’ effective or ineffective examples as originally suggested by Flanagan). It has also been used primarily to drive theory development, which can conceptualise and communicate the enriched understanding gained.

The CIT is particularly useful for understanding information behaviour, especially participants’ feelings when interacting with information (Marcella et al., 2013). As it elicits concrete examples, it encourages movement from general to specific detail, potentially providing rich data. It also encourages reflection (Urquhart et al., 2003), which we have found useful for fleshing out detail of personal experiences (Makri and Blandford, 2012).

While we only interviewed eight participants, an appropriate CIT sample size is determined more by number of critical incidents reported (in our case seventeen) and their closeness-of-fit to the study purpose (Marcella et al., 2013). Although Flanagan (1954) originally recommended sample sizes in the hundreds or thousands, this was based on a survey approach, where ‘incidents’ were recorded concisely on forms rather than discussed in detail. Much smaller sample sizes are the norm in CIT-based interviews in Information Science (Davenport, 2010), where detail is often paramount. In Information Science CIT studies, a general expectation is each participant contributes 1-2 incidents (Urquhart et al., 2003). However, this is a rough science; Flanagan suggests keeping “*a running count on the number of new critical behaviours*” (p.345) identified as the research progresses. This is akin to *theoretical saturation*, common in qualitative analysis, where the sample size is not determined based on numbers but on whether additional data enriches insight. Several examples of gratitude were collected (2.1 average per participant, seventeen in total), involving a variety of online communities. Towards the end of recruitment, adding additional participants did not result in further extension or refinement of the gratitude model. Therefore, a suitable level of saturation was achieved that supports the generalisability of the gratitude model across online communities.

Data analysis approach

A Thematic Analysis (TA) was conducted (Braun and Clarke, 2006). TA usefully complements CIT, as creating overarching and regular themes in TA mirrors creating categories and sub-categories of Critical Incident data in CIT. Although the analysis approach was inductive, it involved continually relating findings to prior work on gratitude. Care was taken to ensure the analysis was not overly influenced by existing gratitude research, or our intuitive understanding of gratitude.

The analysis approach was guided by a critical realist epistemology, which involved progressing from description (where data is organised and summarised to reveal patterns) to *interpretation* (where the significance and broader implications of the findings are considered, often in relation to prior work) to provide a rich account. A critical realist approach to understanding gratitude assumes the existence of

an objective reality outside individual conceptions of the phenomenon, but no single 'correct' understanding of gratitude; this depends on the analyst's perspective.

Braun and Clarke's (2006) TA phases were followed; transcripts were re-read for familiarity. Data was systematically coded across the dataset and collated into potential themes. Initial themes included factors involved in feeling grateful ('grateful factors'), reasons for people not expressing gratitude when they experienced it ('reasons for non-expression') and reasons for people not acknowledging an expression of gratitude when they received it ('reasons for non-acknowledgement'). Themes were refined by reviewing the applicability of coded extracts to their assigned theme and of themes to the dataset. Through visually mapping the themes, a sequence of motivations, behaviour and emotional responses was identified. This evolved into a process model of gratitude in online communities, where themes are represented as inter-related stages and the relationships between stages constitutes the 'narrative' of the process. For example, 'grateful factors' became sub-themes of the 'feel grateful' stage, which was followed by 'express gratitude'.

Findings

The 'gratitude cycle'

Patterns in participants' examples of giving and receiving thanks gave rise to a process model of gratitude expression and acknowledgement in online communities (the 'gratitude cycle,' figure 1). The model provides a detailed, holistic description of how gratitude occurs in online communities - focusing on how gratitude expression and acknowledgement occurs, can break down and can be re-enforced.

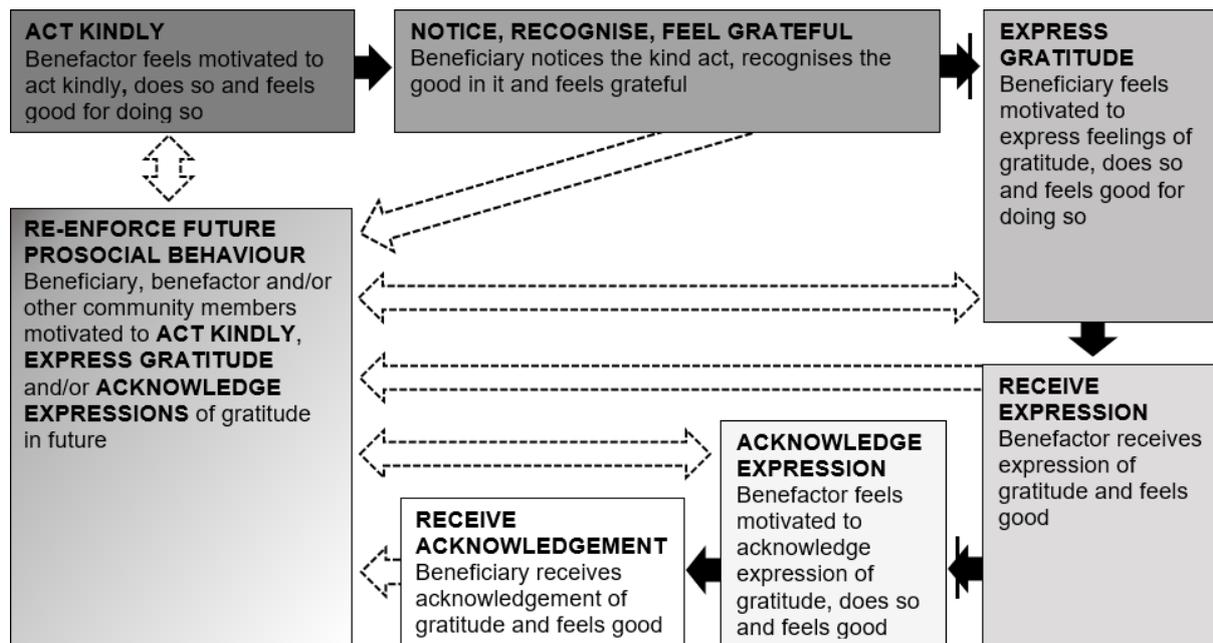


Figure 1: Process model of gratitude in online communities (the 'gratitude cycle')

A 'benefactor' (who performs a kind act someone will feel grateful for) feels motivated to act kindly, *acts kindly* and feels good for doing so. The 'beneficiary' (whom the kind act is directed to) *notices* the kind act, *recognises* the good in it and *feels grateful*. The physical act of noticing, cognitive act of recognising and emotional act of feeling grateful are strongly inter-linked and therefore presented as a combined process stage. The beneficiary may or may not *express* their feelings of gratitude to the benefactor. If they do, the benefactor may or may not *receive the expression*. If they do, they are likely to feel good and may or may not *acknowledge* the expression. If the benefactor does acknowledge it and the beneficiary *receives the acknowledgement*, the beneficiary is likely to feel good. In figure 1, the background colour of each process stage gets lighter as we move through the cycle to indicate the decreasing potential for the cycle to progress to the next stage. The cycle can potentially be broken (by users, technology or both) at all stages, but especially when a person *feels*

but does not *express* gratitude, or when gratitude is *expressed* and *received* but not *acknowledged* (see arrowheads with a line through).

Feeling, expressing and/or acknowledging gratitude may positively *re-enforce* the future behaviour of the benefactor, beneficiary or other community members. When this happens, they feel motivated to 1) undertake kind acts for other community members, 2) express their feelings of gratitude when others act kindly towards them and/or 3) acknowledge others' expressions of gratitude towards them. This forms a positive cascading cycle of kind acts and resultant gratitude. This is represented in figure 1 by arrows with dashed outlines; all stages can potentially re-enforce prosocial behaviour. Double-headed arrows indicate stages that might be re-enforced or, put another way, the future actions people might be motivated to perform (i.e. act kindly, express gratitude and acknowledge expressions of gratitude). The positive cycle is also represented by the 're-enforce' background gradient moving diagonally from light to dark, 're-energising' the process.

ACT KINDLY

Motivation to act kindly was seemingly intrinsic (i.e. inherently rewarding); participants who performed kind acts reported to do so altruistically, based on an internal desire to be helpful and without expecting direct benefit. They were often aware their 'good deed' might trigger a positive emotional response in the beneficiary; "*knowing that it would invoke a positive feeling, make my friends happy*" (P1). While there was no specific evidence of extrinsic motivation (motivated by a separable outcome), several participants mentioned the incidental benefit of gaining community standing and some referenced online community reward mechanisms, e.g. 'kudos points' and leader boards, which muddied the motivation water; while participants regarded rewards as indirect benefits of altruistic acts and did not *expect* reciprocal benefit, they enjoyed experiencing reciprocal benefit and considered cycles of direct and indirect reciprocity useful for sustaining the health of the community. This echoes Self Determination Theory (Ryan and Deci, 2000), which posits that extrinsic motivation is not 'external' to an individual but exists on a continuum from passive and controlling (e.g. expressing gratitude because the online platform forces users to) to active and volitional (e.g. expressing gratitude due to the desire to 'play one's part' in sustaining the community). Performing kind acts was not sufficient to encourage participants to continue to act kindly in the future; this was contingent on whether gratitude was expressed for these acts.

Examples of acting kindly usually involved replying to other community members' forum posts or questions, providing information, advice or support. For example, P2 was struggling to book a hospital appointment and asked for advice in an endometriosis Facebook group. A member replied with the contact details of a hospital employee she had found helpful. P2 contacted the employee, who booked an appointment which led to her health issue being resolved promptly. P2 noted the value of seeking advice from people who were going through similar experiences, as they 'empathised' with her situation. P7 offered encouragement by thanking someone on LinkedIn for posting a link to a Vlog he created and asking him to keep posting them. He was motivated not only because he valued the content, but because the VLogger had questioned whether he was to continue producing Vlogs, as he was struggling to do so alongside his job.

Participants felt good after acting kindly, especially when they felt they had altruistic motives. For example, P1 stated "*I like giving more than receiving. It felt good, like a selfless act.*" P8 mentioned 'feeling good' both when others acted kindly towards him and when he acted kindly towards others. While the positive feeling usually subsided within minutes of acting kindly, it could be 're-kindled' and potentially intensified if and when the beneficiary expressed gratitude for the kind act.

NOTICE, RECOGNISE, FEEL GRATEFUL

Kind acts were mostly noticed manually (e.g. by participants actively tracking discussion threads), but also through electronic alerts (e.g. through receiving e-mail/mobile alerts, social media notifications). For example, P2 received a notification alerting her to replies to her post to the endometriosis Facebook group, potentially speeding-up the resolution to her issue and sustaining the gratitude momentum.

Merely noticing a kind act was not sufficient for feeling grateful; the beneficiary also had to recognise the good in it. This was highly subjective, but usually involved the act being perceived as exceeding expectations, or the norm: *“gratitude is feeling thankful for when someone has gone out of their way by doing something they didn’t have to do”* (P3). P5 stated he would only send a personal thank-you message to a host on online community platform Airbnb if they did something ‘out of the ordinary,’ such as making breakfast.

P8 described gratitude as a continuum, where he was less likely to feel or express ‘mild’ gratitude but more likely when he felt the person had gone ‘above and beyond,’ illustrating that gratitude is regulated by social norms:

“I mostly experience mild gratitude, with occasional peaks. Mild is from things you expect to happen, like if you help someone understand something. They thank you because they feel somewhat grateful and you feel good in return. Social norms expect you to say thank you for kind acts. So people have a baseline of gratitude. Other times people go above and beyond and I feel very grateful in those cases” (P8).

P5, who used travel review site Tripadvisor to rate his experience with a campervan rental firm in Barcelona, felt the firm had offered service that *“went far beyond transactional...out of the kindness of their heart”* by offering him tailored sightseeing advice and complementary use of a mobile phone during the rental.

Feeling grateful was universally regarded as a *“very positive nice feeling”* (P2); a warm feeling that acted as an emotional driver for gratitude expression. It was, however, regarded as a ‘fleeting’ experience (P7), highlighting the importance of ‘striking while the iron’s hot’ (i.e. expressing gratitude before the positive feeling subsides). While kind acts were rarely forgotten entirely, the more time passed, the less likely participants were to express gratitude.

Participants often felt grateful immediately after recognising the good in the kind act, but in the case of online reviews or advice, the feeling of gratitude was often delayed until after they had received positive benefit, or was intensified by that benefit. For example, P6 felt most grateful for a forum post that provided advice on preparing for a half-marathon straight after the run, when she noted the advice had worked; *“the post told me how to manage my water intake. I wasn’t thirsty and I didn’t need to go for a wee half way through.”* She was ‘really thankful’ for the post and thought she *“would not have been as confident or well-prepared”* without it.

EXPRESS GRATITUDE, RECEIVE EXPRESSION

Participants generally wrote text-based expressions of gratitude, even when semi-automated mechanisms (such as ‘like’ or ‘thanks’ buttons) were available. Their messages often went beyond thanking the benefactor of the kind act by explaining how, or to what extent the act helped them or the emotional impact it had. For example, P8 wrote why he liked a podcast episode when sharing a link to it on Twitter in the *“hope someone listens to it and gets as much out of it as I do”* (P8). P2 replied to her own endometriosis support group post stating she really appreciated the people who responded taking time out to help. P1 sent her friends in Japan a wedding gift and was touched when they posted a photo of the gift on Facebook, wrote a long public thank-you post *and* sent her a private message praising her thoughtfulness. This highlights the considerable effort beneficiaries often put into expressing thanks, often due to the emotional impact of the kind act, as explained by P5 who created a Tripadvisor account specifically to thank the Catalan campervan rental company:

“It wasn’t easy, which is probably testament to the way that I felt. It’s easy to swipe a five-star rating on Uber. But there was friction in having to create a Tripadvisor account and find the company” (P5).

Whether the gratitude expression was made publicly, privately (to the benefactor) or both depended on the nature of the kind act, beneficiaries’ preferences and the gratitude expression mechanisms supported by the platform. Some participants felt esteem through receiving public expressions of gratitude, such as P1 when she saw her friend’s public Facebook post thanking her for the wedding gift. Several participants also demonstrated awareness that public expressions could benefit the

benefactor, or other members; P5 hoped his campervan rental review “*would help them generate more business,*” commenting that “*leaving a public review is the highest form of regard.*”

Sometimes a mixture of public and private expressions were made, often for different purposes. For example, when P6 asked for advice on researching a topic on a private Facebook group for Religious Education teachers, he received several empathetic replies from teachers offering to send him resources. He sent a public message to “*acknowledge all the people who had gone out of their way to try to be helpful, even if they had nothing tangible to offer me*” and private messages to thank individuals for specific resources sent. He posted a ‘generic’ public expression in-line with online community etiquette:

“It’s more of an automated response when you thank people publicly, part of the protocol of being in an online community. It’s less generic when you do it privately” (P6).

Receiving gratitude expressions was regarded as inherently positive as “*there can only be positive conversations that spin off an expression of gratitude, so there’s a real feel-good factor involved*” (P1). It triggered various positive emotions among beneficiaries; P6 “*felt surprised and overwhelmed that even though these teachers had spent so much time preparing those resources, they were willing to share them with a stranger,*” while P4 felt re-assured when she received a late-night response from her midwife on Facebook after struggling to breastfeed her tongue-tied son:

“One time I messaged her at 3AM and she replied at 3.30! I said ‘Something’s still not right. Can I come to the hospital?’ She replied saying ‘come first thing tomorrow.’ So I went to bed thinking ‘I can sleep as I know everything’s sorted.’ I felt grateful she’d got back to me so quickly” (P4).

ACKNOWLEDGE EXPRESSION, RECEIVE ACKNOWLEDGEMENT

Participants often felt motivated to acknowledge others’ expressions of gratitude, sometimes with a simple ‘you’re welcome,’ others with more detailed, personalised responses. For example, when P1 saw her newlywed friends had posted a photo of her wedding gift on Facebook, she commented on and ‘liked’ the photo to acknowledge the gratitude expression “*to show I’d seen it. I wanted to show gratitude the other way.*”

Just as acting kindly evoked positive emotions among benefactors, so did receiving acknowledgement of gratitude expressions; “*acknowledgement makes you feel happy you’ve helped someone else. You feel proud you’ve done something good*” (P4). P2 felt ‘happy’ when other endometriosis support group members took an interest in her condition after she offered advice to a member:

“Receiving thanks definitely made me feel happy. When I first answered someone’s endometriosis post, I was surprised people replied and asked about me. So I guess I felt grateful for their gratefulness” (P2).

When it happened, acknowledgment completed the cycle of *acting kindly, expressing gratitude* for the kind act and *acknowledging the expression* of gratitude. By completing the cycle, both beneficiary and benefactor often felt positive. For example, after receiving a response to his Tripadvisor review from the campervan rental company, P5 stated “*it was very clear I was happy with the rental firm helping me and equally clear they were happy that I was happy. I like acknowledgement of gratitude.*” P8 regarded acknowledgement as “*closing the loop.*”

RE-ENFORCE FUTURE PROSOCIAL BEHAVIOUR

All stages in the gratitude process positively re-enforced future prosocial behaviour (see single-headed arrows in figure 1), resulting in the future actions of acting kindly, expressing gratitude and/or acknowledging expressions of gratitude (double-headed arrows).

All participants noted feeling grateful could motivate the beneficiary to express gratitude ('giving thanks') and act kindly to other community members ('paying it forward'; McCullough et al., 2001). For example, P2 stated that while gratitude might not always be expressed in other settings, endometriosis support group members went 'out of their way' to, as there was a 'strong community spirit.' She tried to answer others' questions as "*feelings of gratitude make me want to help other people.*" She regarded this as "*giving back to the community.*" Similarly, after P6 received useful teaching resources from group members, he expressed a desire to pay it forward:

"I'd like to think that I'd be of use to someone in that group in the future. They seem very willing to help and I'd like to be considered a helpful person in the group" (P6).

Several noted receiving expressions of gratitude could motivate the benefactor to acknowledge those expressions and continue to act kindly to other members. For example, P8 'felt great' when people liked his shared podcast comments, encouraging him to share more often. He stated "*it feels like the cycle of gratitude has been completed.*" Similarly, P1 demonstrated awareness of the positive perpetual nature of gratitude:

"I know the importance of gratitude, so I do like to show it to people. Gratitude builds relationships and improves them. Once you do something and it's experienced positively, you would want to do it again" (P1).

Some noted expressions and acknowledgements of gratitude could encourage other members (e.g. observers) to act kindly and/or express gratitude when someone directed a kind act towards them (third-party influence through 'social contagion'; Tsvetkova and Macy, 2014). For example, P1 stated "*a kind act can give others ideas of similar acts they might want to carry out themselves*" and P7 stated since "*expressing gratitude makes you think a bit more about other people,*" he might keep expressing feelings of gratitude when he had them.

Potential for breakdown

Participants described gratitude as a positive cycle susceptible to breakdown at all stages of the process, but particularly when gratitude is felt but *not expressed* and expressed but *not acknowledged*. For example, P5 stated if people did not express gratitude for kind acts, "*you're going to reduce the chance of the gratitude cycle continuing.*" Similarly, P2 thought community members had a social obligation to perpetuate the cycle:

"If someone is taking the time out to help you, everyone should be mindful that it is social etiquette to be thankful and continue that cycle. Everyone has an individual responsibility to keep it going" (P2).

Gratitude felt but not expressed

Sometimes gratitude was felt but not expressed; P2 explained gratitude expression was necessary to make others aware of it:

"Being grateful is sometimes an internal thought. Maybe sometimes people are grateful and you don't know about it" (P2).

Often participants intended to express gratitude, but delayed or forgot (especially when their feelings of gratitude were not particularly strong). They became less likely to express gratitude as the feeling subsided. P1, for example, often intended to leave Tripadvisor reviews for restaurants she liked but forgot. This extended to the 'amazing' restaurant she visited based on others' reviews. P3 provided a similar Tripadvisor example, explaining she would be more likely to express gratitude at the time it was felt:

"We told the chef how amazing the food was and he asked us to write a review on Tripadvisor. We were like 'yeah sure,' but we never did. By the time you get home, it's no longer something important to you. Even though I'd like to think I'd take the time to write something, I didn't. If it was all set up on an iPad to do it then and there, I would" (P3).

Some participants deliberately did not express gratitude, because they did not feel grateful *enough* to motivate expressing, or because expressing required more effort than they were prepared to give. Both P1 and P5 described their use of online communities as 'selfish,' because they did not contribute even when they felt grateful for information they received. P1 described herself as a 'voyeur' as she did not 'place value' on writing thankful reviews of good restaurants. P5 did not make the effort to express gratitude on social Q&A sites if he did not 'feel part of the community':

"I've taken information and been really pleased because that answer has saved me time and money. But I don't log in because I don't feel part of that community. So I don't thank that person for the information they have provided. I'm selfish I guess" (P5).

Participants who followed an online community without actively participating in it (the 'voyeurs') felt justified not expressing gratitude because the kind act was not directed specifically towards them. Referring to helpful forum posts, P1 commented *"they don't know I'm reading it and that's what they've provided it for."*

Gratitude expressed but not acknowledged

Acknowledging *kind acts* (gratitude expression) was regarded as essential for perpetuating the gratitude cycle, but acknowledging *expressions of gratitude* themselves was only regarded as necessary by some. On one hand, some regarded it as essential 'common courtesy.' For example, P5 stated he would 'feel worse' if his gratitude expressions were not acknowledged than if nobody had responded to his forum post requesting advice:

"I want acknowledgement of my gratitude. If I put thanks out there, I want to know someone saw it and what they felt. I think I'd feel worse if I said thank you and nobody responded than if no one responded to my original post in the first place" (P5).

Others regarded acknowledgement as non-essential, but desirable. For example, P6 said he did 'not take it personally' if people did not acknowledge his thanks as he was 'fairly inconsistent' in his use of online communities. Similarly, P4 did not 'need' acknowledgment, but it reassured her the benefactor had seen her expression of gratitude:

"I've not thought 'oh, that person didn't say thanks for thanks.' It's not something I need afterwards. But the times where someone has 'liked' a 'thank you' comment from me, I've thought 'that's nice to know they have seen it'" (P4).

Discussion

The Critical Incident examples gave rise to an empirically-grounded process model of gratitude in online communities (the 'gratitude cycle'). This model *enriches understanding of gratitude in online communities* and how it can be sustained by providing a detailed, holistic description of the *experience of gratitude in online communities*, focusing on how online gratitude expression, acknowledgement, breakdown and re-enforcement occurs. The 'gratitude cycle' and the enriched understanding of online gratitude it provides can *inform the design of online community platforms*. These contributions are discussed below.

Enriching understanding of gratitude in online communities

The 'gratitude cycle' model provides a detailed understanding of online gratitude expression, acknowledgement, re-enforcement and potential for breakdown and re-enforcement. The model emphasises the cyclic, cascading nature of gratitude, where expressing and acknowledging thanks can encourage online community users to act kindly to others in the community, express their feelings of gratitude when others act kindly towards them and acknowledge others' expressions of gratitude directed towards them. The model also provides a holistic understanding of gratitude – emphasising the inter-connectedness of stages in the cycle and highlighting that *all* stages (not just acting kindly or expressing gratitude) can encourage future prosocial behaviour. This model can be used to frame future studies of gratitude-related information interaction by sensitising researchers to parts of the

process to examine further, such as how gratitude is expressed or acknowledged (or how these process stages can break down or be re-enforced) in specific communities.

The novelty of the model is in providing a detailed, holistic understanding of how online community users experience gratitude; while previous work has identified key aspects of gratitude in offline contexts and highlighted the importance of gratitude in online communities, we are unaware of any existing work that has sought to understand (or model) how online community members experience gratitude.

Modelling the experience of gratitude in online communities

The 'gratitude cycle' model integrates previous findings on gratitude and prosocial behaviour into a coherent descriptive model. It complements existing experimental findings from Positive Psychology, providing supporting evidence outside of Psychology through an interview-based (rather than experimental) empirical approach. It also complements existing Information Science and Computer-Mediated Communication research on online community participation.

Findings highlight the cyclic nature of gratitude; gratitude functioned as moral barometer, motivator and re-enforcer (McCullough et al., 2001), evidenced by reports of a cascading effect of positive contagion (Fowler and Christakis, 2010). As in experimental settings, experiencing gratitude was reported to encourage future prosocial behaviour among both beneficiaries and benefactors (McCullough et al., 2001), and among other community members through third-party influence (Layous et al., 2017). Motives were reported as seemingly altruistic, akin to 'gift giving,' (Tinto and Ruthven, 2016). However, several participants reported enjoying feeling socially rewarded (see Grant and Gino, 2010), with some expressing clear desire for reward and increased social standing. This suggests reward mechanisms may be muddying the water between altruism and reciprocity. While nobody expected *direct* reward for kind acts, expectation of *indirect* future rewards (someone in the community performing a kind act towards them when needed) suggests some degree of reciprocal behaviour. Collective reciprocity ('paying it forward' to the community) was far more common than individual reciprocity ('paying it back' to the individual who acted kindly). The relatively large membership of the online communities participants discussed may have made collective reciprocity more feasible due to the likelihood of easily finding a different member to assist and, conversely, the unlikelihood of the beneficiary of a kind act needing assistance themselves in the near future. Evidence was also found of fairness-based selective giving (Wu and Korfiatis, 2013), as gratitude was felt strongest when beneficiaries thought benefactors had gone 'out of their way' or 'above and beyond.'

Informing the design of online community platforms

An enriched understanding of the experience of gratitude is useful for reasoning about how best to support and sustain the process through design; the 'gratitude cycle' can be leveraged by designers of online community platforms to reason about how best to support individual stages and the overall gratitude process, prevent process breakdown and conversely encourage re-enforcement. This is with the aim of motivating users to act prosocially, hence perpetuating the gratitude cycle. Suggestions for better supporting stages of the cycle follow. Although they represent 'evolutionary' rather than 'revolutionary' design improvements, they are rarely (if at all) supported by existing platforms.

While feeds and alerts can support *noticing and recognising* the good in kind acts, so too can encouraging a broader sense of awareness of who is participating and how (e.g. by promoting recent, most viewed or most replied-to posts). Although functionality to track specific discussion threads or feeds is commonplace, the ability to customise regular updates on particular topics, or on the activity of certain members is not (outside of mainstream social media platforms). Indicating the proportion of a member's contributions that have triggered grateful responses and the ability to view them can also support *noticing*, making effort made versus benefit gained visible. Supporting examination of these contributions and associated gratitude expressions and acknowledgements could help members assess the value of others' contributions, for example by providing a history of 'posts this member has been thanked for'.

Reward mechanisms such as points and upvoting can potentially quantify gratitude, encouraging communities to value social standing and encouraging perpetuation of the gratitude cycle, especially *expressing* gratitude. But they can also undermine gratitude expression by ‘gamifying’ the notion of reward, which can, in turn, encourage users to game the system. While some participants were comfortable with the ‘commoditisation’ of gratitude, others expressed a strong desire to avoid it. Shifting away from rewarding volume of contributions or times thanked, towards rewarding *quality* of contribution (including helpfulness, as rated by other members) may help in this regard. Supporting gratitude expression ‘while the iron’s hot’ could be achieved through omni-channel design that encourages expression at times where the beneficiary is most likely to feel grateful; a mobile alert shortly after eating at a restaurant or staying at a hotel, or an e-mail reminder shortly after receiving a reply to a forum post. ‘Remind me to thank’ functionality could allow members to easily state their intent to express gratitude, encouraging them to follow through.

A key design challenge involves supporting *gratitude expression* in ways that balance efficiency and efficacy of expression. Lightweight approaches (such as ‘like’ or ‘thanks’ buttons) support quick and easy expression, potentially allowing members express gratitude as soon as it is felt and encouraging participation from voyeurs. But these types of responses were not always adequate; several participants preferred to receive personalised textual responses, which were regarded as more heartfelt. ‘Like because’ or ‘thanks because’ templates, containing customisable text relevant to the specific domain area or online community, might encourage people to explain *how* or *why* a certain contribution helped them (i.e. why they are grateful for it). One approach is to provide a lightweight ‘low entry cost’ approach (e.g. a thanks button) which, when invoked, starts an (optional) more detailed dialogue (e.g. based on a ‘thanks because’ template). This would allow for both ‘quick and easy’ and longer, but potentially more meaningful expression.

As messages *acknowledging* gratitude are usually more generic, these can be semi or fully automated (e.g. through an automatic acknowledgement when a post or review is read, like an e-mail ‘read receipt’). Alternatively, notifications reminding members to acknowledge replies to their posts could be combined with a lightweight acknowledgement mechanism. Users should have control over the volume and frequency of notifications they receive, however, to minimise potential for information overload.

Arguably the strongest motivation for prosocial behaviour might come from the community itself; platforms might support communities in defining their own protocols for gratitude expression and acknowledgment, providing customisation options so gratitude-related functionality is tailored to the specific needs and nature of the community. The ‘best’ ways of encouraging prosocial behaviour are likely to differ across different community types. Members also play a key role in nurturing and sustaining a culture that strongly values expressing and acknowledging gratitude. Platforms could provide tailored functionality that supports this, in ways that are synergistic to the community culture.

Limitations and future work

A possible criticism of the gratitude cycle is that although it is empirically-grounded, it is intuitively ‘obvious,’ perhaps due to gratitude being such a ubiquitous and relatable emotion. However, the gratitude process is only obvious in hindsight; we are unaware of any prior work that has sought to model the process of gratitude expression and acknowledgement (either online or offline). Another is that the model is too generic (i.e. non-technology-specific). Although it describes the gratitude process without referring to technology specifically, the model is empirically grounded in gratitude examples in *online communities*, making it specific to this context. This also means, however, that further research is needed to establish the extent to which it can generalise beyond online communities.

Future studies might examine the affordances of specific online community platforms for supporting and hindering gratitude expression, acknowledgement and re-enforcement, potentially creating a technology-specific model. Future research might also compare experiences of gratitude across different online communities to better understand how it manifests on different platforms and how best to design to engender it. This could be achieved by following a similar Critical Incident approach as our study and complemented by a secondary analysis of posts on various online community platforms.

Other promising research directions include examining the influence of platform design on users' gratitude expression and acknowledgement, investigating (longitudinally) the impact of gratitude expression and acknowledgement on users' future prosocial behaviour, examining the potential negative effects of gratitude expression on online communities (e.g. when perceived as insincere, or based on non-altruistic intentions), investigating interaction design approaches aimed at substituting non-verbal communication in an online communities context and investigating, through design and user research, how best to strike the balance between lightweight and meaningful gratitude expression and acknowledgement.

Conclusion

Seventeen memorable examples of giving and receiving gratitude in online communities were elicited to better understand how gratitude expression and acknowledgement occurs and can break down or be re-enforced. Findings gave rise to a process model of gratitude in online communities, the 'gratitude cycle,' which describes the holistic user experience of gratitude in detail. The model can inform the design of online community platforms that aim to encourage users to perform kind (prosocial) acts, recognise kind acts performed by others, express their feelings of gratitude and acknowledge others' expressions of gratitude. By doing so, these platforms can motivate users to perpetuate the gratitude cycle.

Encouraging gratitude can not only benefit individuals, but also encourage participation and a feeling of belonging in online communities, helping them survive and thrive. Platforms must move beyond existing lightweight and overly-reward-driven design approaches to support simple, yet meaningful gratitude expression and acknowledgement. This will offer more of a human touch to functionality that supports this fundamental human experience. How best to achieve this remains a future research and design challenge.

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References

- Bartlett, M.Y. and DeSteno, D. (2006). Gratitude and prosocial behavior: Helping when it costs you. *Psychological Science*, 17(4), 319-325.
- Belanche, D., Casalo, L.V., Flavián, C. and Guianlíu, M. (2018). Reciprocity and commitment in online travel communities. *Industrial Management & Data Systems*.
- Bishop, J. (2007). Increasing participation in online communities: A framework for HCI. *Computers in Human Behavior*, 23(4), 1881-1893.
- Braun, V. and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.
- Carron-Arthur, B., Ali, K., Cunningham, J.A. and Griffiths, K.M. (2015). From help-seekers to influential users: A systematic review of participation styles in online health communities. *J. Medical Internet Research*, 17(12), e271.
- Chang, H.J. (2009). Online supportive interactions: Using a network approach to examine communication patterns within a psychosis social support group in Taiwan. *JASIST*, 60(7), 1504-1517.
- Chang, Y.P., Lin, Y. C. and Chen, L.H. (2012). Pay it forward: Gratitude in social networks. *J. Happiness Studies*, 13(5), 761-781.

- Dantonio, L., Makri, S. and Blandford, A. (2012). Coming across academic social media content serendipitously. *Proc. ASIS&T* 49(1), 1-10.
- Davenport, E. (2010). Confessional methods and everyday life information seeking. *Annual Review IS&T* 44(1), 533-562.
- Fang, Y., Lu, T., Zhang, P., Gu, H. and Gu, N. (2018). Exploring the effect of politeness on user contribution in Q&A sites: A case study of stack overflow. *Proc. CSCWD*, 713-718. IEEE.
- Feng, Y. and Ye, H.J. (2016). Why do you return the favor in online knowledge communities? A study of the motivations of reciprocity. *Computers in Human Behavior*, 63, 342-349.
- Flanagan, J. (1954). The critical incident technique. *Psychological Bulletin*, 51, 327–358.
- Fowler, J.H. and Christakis, N.A. (2010). Cooperative behavior cascades in human social networks. *Proc. National Academy of Sciences*, 107(12), 5334-5338.
- Grant, A.M. and Gino, F. (2010). A little thanks goes a long way: Explaining why gratitude expressions motivate prosocial behavior. *J. Personality and Social Psychology*, 98(6), 946-955.
- Greenberg, M.S. (1980). A theory of indebtedness. *Social exchange*, 3-26. Springer, Boston, MA.
- Hew, K.F. and Hara, N. (2007). Knowledge sharing in online environments: A qualitative case study. *JASIST*, 58(14), 2310-2324.
- Hsu, C.L. and Lin, J.C.C. (2008). Acceptance of blog usage: The roles of technology acceptance, social influence and knowledge sharing motivation. *Information & Management*, 45(1), 65-74.
- Kim, S and Oh, S. (2009). Users' relevance criteria for evaluating answers in a social Q&A site. *JASIST*, 60(4), 716-727.
- Köylü, Z. (2015). Thank you so much! Mystery Solved': Online Expressions of Gratitude by IMDb Members. *Dil Dergisi* 169(1), 21-50.
- Kuznetsov, S. (2006). Motivations of contributors to Wikipedia. *ACM SIGCAS Computers and Society*, 36(2).
- Lampel, J. and Bhalla, A. (2007). The role of status seeking in online communities: Giving the gift of experience. *Journal of Computer Mediated Communication*, 12(2), 434-455.
- Lampinen, A., Lehtinen, V., Cheshire, C. and Suhonen, E. (2013). Indebtedness and reciprocity in local online exchange. *Proc. CSCW* (661-672). ACM.
- Layous, K., Nelson, S.K., Kurtz, J.L. and Lyubomirsky, S. (2017). What triggers prosocial effort? A positive feedback loop between positive activities, kindness, and well-being. *Journal of Positive Psychology*, 12(4), 385-398.
- Makri, S. and Blandford, A. (2012). Coming across information serendipitously – Part 1: A process model. *J. Doc.* 68(5), 684–705.
- Manela, T. (2015). Gratitude. *Stanford Encyclopedia of Philosophy*. <https://plato.stanford.edu/entries/gratitude> [Accessed 21/12/18].
- Mpinganjira, M. (2017). Willingness to reciprocate in virtual health communities: The role of social capital, gratitude and indebtedness. *Service Business*, 1-19.
- Marcella, R., Rowlands, H. and Baxter, G. (2013). The critical incident technique as a tool for gathering data as part of a qualitative study of information seeking behavior. *Proc. ECRMBMS*. Guimaraes, Portugal.

- McCullough, M.E., Kilpatrick, S.D., Emmons, R.A and Larson, D.B. (2001). Is gratitude a moral affect? *Psychological Bulletin*, 127(2), 249-266.
- McCullough, M.E., Kimeldorf, M.B. and Cohen, A.D. (2008). An adaptation for altruism: The social causes, social effects, and social evolution of gratitude. *Current directions in psychological science*, 17(4), 281-285.
- Nowak, M.A. and Roch, S. (2007). Upstream reciprocity and the evolution of gratitude. *Proc. Royal Society of London: Biological Sciences*, 274(1610), 605-610.
- Oh, S. (2012). The characteristics and motivations of health answerers for sharing information, knowledge, and experiences in online environments. *JASIST*, 63(3), 543-557.
- Oh, S. and Syn, S.Y. (2015). Motivations for sharing information and social support in social media: A comparative analysis of Facebook, Twitter, Delicious, YouTube, and Flickr. *JASIST*, 66(10), 2045-2060.
- Perterson, C. (2006). *A Primer in Positive Psychology*. NY: OUP.
- Raban, D. and Harper, F. (2008). Motivations for answering questions online. *New Media and Innovative Technologies*, 73.
- Rubenstein, E. (2009). Dimensions of information exchange in an online breast cancer support group. *Proc. ASIS&T*, 46(1), 1-5.
- Ryan, R.M. and Deci, E.L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54-67.
- Savolainen, R. (1995). Everyday life information seeking: Approaching information seeking in the context of "way of life". *Library and Information Science Research*, 17(3), 259-294.
- Syn, S. and Oh, S. (2015). Why do social network site users share information on Facebook and Twitter? *JIS* (41(5), 553-569.
- Tinto, F. and Ruthven, I. (2016). Sharing "happy" information. *JASIST*, 67(10), 2329-2343.
- Tsang, J.A. (2006). The effects of helper intention on gratitude and indebtedness. *Motivation and Emotion*, 30(3), 198-204.
- Tsvetkova, M. and Macy, M.W. (2014). The social contagion of generosity. *PloS one*, 9(2), e87275.
- Urquhart, C., Light, A., Thomas, R., Barker et al. (2003). Critical incident technique and 'explicitation' interviewing in studies of information behavior. *LISR*, 25(1), 63-88.
- Watkins, P., Scheer, J., Ovnicek, M. and Kolts, R. (2006). The debt of gratitude: Dissociating gratitude and indebtedness. *Cognition & Emotion*, 20(2), 217-241.
- Wong, A. (2013). Using the critical incident technique to evaluate the service quality perceptions of public library users. *Information Research* 18(3), S10.
- Wood, A.M. (2014) Gratitude. In Michalos, A.C. (ed.). *Encyclopedia of Quality of Life and Well-Being Research*, NY: Springer, 2609-2611.
- Wu, P.F. and Korfiatis, N. (2013). You scratch someone's back and we'll scratch yours: Collective reciprocity in social Q&A communities. *JASIST*, 64(10), 2069-2077.
- Yang, X., Li, G. and Huang, S.S. (2017). Perceived online community support, member relations, and commitment: differences between posters and lurkers. *Information and Management*, 54(2), 154-165.