# Why Users Disintermediate Peer-to-Peer Marketplaces

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## ABSTRACT

This paper reports on a study of the prevalence of and possible reasons for peer-to-peer transaction marketplace (P2PM) users turning to out-of-market (OOM) transactions after finding transaction partners within a P2P system. We surveyed 97 P2PM users and interviewed 22 of 58 who reported going OOM. We did not find any evidence of predisposing personality factors for OOM activity; instead, it seems to be a rational response to circumstances, with a variety of situationally rational motivations at play, such as liking the transaction partner and trusting that good quality repeat transactions will occur in the future.

## Author Keywords

Peer-to-peer marketplaces; motivations; disincentives.

## ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## INTRODUCTION

In a May $8^{th}$, 2015 post on UberPeople—a site for the popular Uber rideshare service's drivers to communicate with each other—TimFromMA wrote:

*"A friend of mine who drives for Uber just told me about his own method of screwing uber over. When he gets a ping, he drives to the location. He offers the passenger a small discount on the quoted fare if they pay him directly. He can either accept credit cards with his phone or takes cash. If the passenger accepts the deal, he gets them to cancel the trip, goes offline and drives them to their destination. If the passenger doesn't take the deal, he ubers them over the traditional way."*

Uber, in response to such activity, has been advocating that passengers *"report a ride taken out of policy"* and drivers engaging in such behavior can be terminated. But is the

problem of circumventing the system a significant one? And if so, why does it occur and should services like Uber try to stop it? In this paper, we explore these questions.

We define P2PMs as platforms where users can post offers or requests for goods and services and initiate transactions with other users (their *peers*). The marketplace's infrastructure may be simple, like that of Craigslist, where advertisers may pay to post an ad and communications with responders thereafter are informal (though the poster will usually use email via a hidden address provided by Craigslist). However, newer services, like Uber, may have a highly constrained, closed system where out-of-market communications and financial transactions are not possible until the provider meets the receiver and can talk in-person to negotiate or find a way to share contact information for later use. In either case, the platform provider usually seeks to generate revenue from transactions between users and so has a vested interest in users staying in its marketplace.

By out-of-market (OOM) transactions we mean exploiting a P2PM in some way, for example by advertising or finding providers or requestors on it, and then going outside the platform (perhaps using email or another communication medium) to complete current or initiate future transactions.

New technology-mediated P2PMs like Uber, Lyft, Airbnb and TaskRabbit provide vast advantages over trying to find transaction partners in traditional ways, instead connecting providers to receivers via browsing, searching, and filtering mechanisms. In some cases, such as transportation, where transactions are time-sensitive and even location-sensitive, there is no other way to find a transaction partner match in time, apart from resorting to traditional means like calling a taxi-cab service. But, once a partner has been found through the platform, there may be incentives for disintermediation of the P2PM—like avoiding paying commissions, or liking a transaction partner—that can outweigh incentives to use the service, such as convenience and choice of providers. So OOM transactions may indicate conflicts of interest between a P2PM provider and its users. This raises important questions as to what those conflicts are and whether it makes sense to try to prevent OOM transactions.

So, given that P2PMs have already solved many basic HCI technology challenges to connect users transparently, it is important to take a more nuanced look at an inherent

problem in the peer-to-peer economy which is not so much a user experience issue but an emergent structural problem of platforms that are designed to connect people for the purpose of economic exchange. So, the main goal of the study reported here is to help P2PM developers understand *how much OOM activity is occurring, why, and whether it is worth preventing with platform design refinements*. In particular, it is important for HCI research such as ours to highlight the end-user point of view in a context where P2PM platform providers generally have the louder voice, through their dominance and marketing capabilities.

To this end, we conducted a survey and interview study to discover the prevalence and real reasons for OOM transactions. Our analysis is both quantitative and qualitative in order to provide complementary perspectives:

- **A survey** allowed a statistical exploration into *the scale of the OOM transaction problem* and, in particular, whether there are *common causal factors* in the tendency to engage in OOM transactions.
- **Interviews** drilled down into individual cases, seeking *specific motivations, contingent on particular circumstances* that were harder to tackle by survey.

In the rest of this paper, we review related work, describe our methods, and present our findings with discussion.

## BACKGROUND AND RELATED WORK

### Causal Factors
As mentioned above, a key question for our study is whether OOM transactions might be related to any common causal factors. We considered *personality type* and *situational factors* as possible causal factors.

### Personality Traits (Predisposing Factors)
We wondered whether some types of personality are simply more prone to OOM transactions as personality has been shown to be related to differences in behavior (e.g., [51]). If this were the case, P2PM platform designers might try to improve their designs to appeal to whatever works best for those personality traits, for example by improving the social experience if extraverts tend to go out-of-market.

Personality traits are individual variations in thought, attitudes and behavior patterns, measured with standardized psychometric surveys, with quantitative responses, (usually on a Likert scale [44]). Evidence shows that these traits are generally fairly stable in adulthood [13, 49] although they do tend to drift with time [52, 53]. However, drift would be a minor factor in our study as we were interested in relatively recent experiences of novel P2P transactions.

In our survey, we selected personality scales that seemed to measure traits that might be predictive of OOM transactions (or of avoidance of them). These included the best known and most frequently studied 'Big Five'; *openness*, *conscientiousness*, *extraversion*, *agreeableness*, and *neuroticism* [18], plus *trustfulness* [37] since trusting others could be important in an agreement to sidestep a P2P

platform, *dutifulness*, [35] since dutiful individuals might find OOM transactions somewhat transgressive and risky, and *kindness* [36] as empathy for a transaction partner might inspire a desire to form an out-of-market bond and inspire informal, friendly transactions, cutting out the impersonal P2P platform. We drew these scales from the International Personality Item Pool [26, 34], a public repository of scales shared for research purposes [22].

### Situational Factors (Economics and Circumstances)
Some argue that situational factors are more important in driving behavior than personality traits [25, 46]. If the situational factors have more to do with why OOM transactions occur, designers might seek to mitigate those factors, rather than worrying about personality types.

A number of *economic* exchange theories propose various situationally driven factors that drive choices and behavior in exchanges that involve effort and rewards. For example, Rational Choice Theory predicts that individuals are motivated to maximize utility in making decisions about economic transactions [30, 55]. However, this theory has been superseded in the social sciences by theories that account for observed irrational human heuristics and biases, individual differences, social motivations and other elements that can influence the decision-making process. We discuss some of these below.

Like Rational Choice Theory, Social Exchange Theory [16, 30] proposes that, in exchanges, transaction partners seek fair returns for all their investments, however, returns are evaluated in terms of many factors such as status, relative power, relationships, security, risk, trustworthiness, and so on. The Equity Sensitivity Construct theory [33] (extending Equity Theory [1, 2]) focuses on people's desire to seek fairness in transactions, but also proposes that people vary in the degree to which they seek rewards relative to their investment in transactions. Some are benevolent, others self-entitled, but some seek equity. Behavioral Economics proposes that humans exhibit characteristic departures from rational behavior (cognitive biases) such as loss aversion, altruism, anchoring, and many more [39, 40, 62]. Taken together, theories like these propose that situationally contingent and complex motivations are at play when making decisions about economic exchanges, which would include deciding whether to initiate OOM transactions. We have space to discuss just a few examples of theory-based expectations for our study outcomes, as follows.

In P2P transactions, there are really three players; the *provider*, the *receiver* and the *platform*. We would expect that peers regard the P2PM as relatively *powerful* because they are *committed* ('commitment' in social exchanges means assigning greater value to an ongoing relationship than to transient ones) to repeated exchanges with it, having few or no alternatives in the opportunity structure, and so may be disincentivized from overtly cheating it out of its share of a transaction's rewards due to the risk of being banned from the all-powerful marketplace. So, we would

expect OOM transactions to be relatively uncommon, and require peers to trust each other not to 'blow the whistle' to the P2PM. We will return to trust later.

On the other hand, a P2PM may be seen as abusing its power by extracting too much value from each transaction. Research [17] informed by social exchange theory suggests that unequal power in exchange networks is naturally reined in by participants' sense of *justice* and *equity* by means of interpersonal commitment (showing preference for someone other than the power-player). So we suspect that some OOM transactions may be motivated by a desire to oppose perceived P2PM unfairness in certain situations.

The *circumstances* of a transaction vary according to the nature of the platform. In some, exchanges are mostly one-offs, in others they are likely to become repeat affairs, entailing commitment between transaction partners. In Behavioral Game Theory, an extension of Game Theory, participants in transactions are predicted to be much more cooperative when future transactions are expected [11]. So, we expect buying and selling platforms such as eBay to be more prone to OOM transactions because of their transaction opportunity structure; purchasers often buy more of the same type of product and will therefore be likely to encounter the same seller repeatedly (especially for niche products) and develop a social relationship, based on familiarity, which will tend to create opportunities and motivations for informal OOM transactions.

In repeat transactions, we might also expect to see *reciprocity* [63] so that a vendor may be motivated to reward a valued customer in a way that a P2PM does not explicitly support. But we would also expect to see this in situations of face-to-face transactions that are co-produced [10]; essentially, where each partner cooperates or helps the other in some way over the course of the transaction. And, based on many of the theories discussed above, we would expect transaction partners to cooperate in equitably *sharing the benefits* of any OOM transaction (for example, dividing the share that would have gone to the P2PM).

Another key situational factor in our enquiry is *trust*. It is required in OOM transactions, since they lack the service guarantees P2PMs often offer [41] and, in some cases, providers are putting their career prospects in the customer's hands – as the customer could report them to the P2PM. The importance of trust has been established in prior research on P2PMs (e.g., [42, 48]). However, since many P2P transactions do not take place face-to-face, but over communications media, trust may take longer to develop [9]. P2PMs compensate for lack of trust between strangers with reputation systems [38, 50] but, although such systems may offer many benefits, as far as trust goes, they have no advantage over OOM transactions, because OOM transactions happen *after* participants have been introduced by the P2PM and gained mutual trust.

Finally, we believed *homophily*—the tendency to like people like oneself—might also be a situational trigger for OOM transactions since homophily is thought to engender both trust [60] and greater likelihood of interacting socially [45] and, intuitively, we expect social interaction would tend to engender OOM opportunities.

**Motivation for Participation in P2P Marketplaces**

Prior work has begun to explore what specifically motivates individuals to engage in P2PMs [6, 14, 15, 41, 43, 57, 59, 64, 65] with a view to determining how P2PM users might be encouraged to participate in this new technology-mediated and efficient form of economic activity.

In some cases, major motivations have been found to be altruistic and/or community oriented [14, 15, 41, 43, 59, 64]. But, an overlapping set of studies has also found that there are significant self-serving motivations, [6, 14, 15, 41, 57, 59, 65] even in ostensibly altruistic services, such as a service where people give away their possessions [6]. In one study of timebanking [57], two distinct clusters of individuals emerged, separated by differing motivations. One group tended toward peripheral involvement and was motivated more by self-serving goals. The other was more deeply committed and motivated more by altruism and community-oriented goals. In another study of Airbnb and Couchsurfing hosting [41], extrinsic (financial) motivations were found to *amplify* intrinsic motivations such as the pleasure of being a competent host or the pleasure of socializing. A significant proportion of the work in this area has also noted the importance of social factors in P2PM participation [6, 14, 15, 41, 64]. So, overall, it seems multiple motivations are generally in play.

Building on this prior work, we are interested in contrasting users' motivations to stay in-market with motivations to circumvent the marketplace. This is a key concern for P2PM providers. For example, timebanks rely on continued detectable user participation, in order to track activity and demonstrate the good they are doing in the community, which then helps them to obtain funding [7]. Others, such as Uber, mentioned in the introduction, lose commissions when users turn off systems designed to support and track their transactions in order to offer services privately.

On the other hand, P2PM users are not, at the time of writing, employees under contract to only engage in transactions through these systems so, therefore, the choice of whether or not to report a transaction is a matter of free choice. And the effort to prevent OOM transactions, whilst a business imperative for platform providers, could be seen as an ethical gray area. Our research cannot resolve this conflict but it does clarify the place of OOM transactions in the overall peer-to-peer economy and may help platform providers make decisions about whether it is worth trying to design their systems to make them difficult or impossible.

## A STUDY OF MARKET CIRCUMVENTION IN P2P SYSTEMS

### Methods

Our study was composed of two parts. An initial profiling and screening survey (offering a $10 Amazon gift certificate as an incentive) was distributed to establish baseline rates of participation in OOM transactions amongst P2P participants. Questions covered:

- Brief demographics (age, gender, education).
- P2PM usage, since how long ago, its frequency, interaction duration, type of service and why used.
- Feelings of similarity to and trust of transaction partners (*situational factors – SFs*).
- Cooperation with transaction partners (*SFs*).
- Experience of OOM transactions, if any, and their frequency and why respondents engage in them, then, focusing on one example, feelings of similarity and trust with that transaction partner (*SFs*).
- Brief personality scales covering the 'big five,' [27] and kindness, trustfulness and dutifulness [34, 35, 36, 37] (*Personality Type Factors*).

Most responses were on 6-to-8 point scales of frequency or degree or 7-point Likert scales [44] indicating extent of agreement. Some were open-ended textual responses.

A subset of individuals who reported having engaged in OOM transactions were interviewed about what motivated them to do so. Interviews were semi-structured, with a consistent set of questions and participants received a $40 Amazon gift certificate. Questions covered both P2P and OOM transactions. We focused on a recent transaction as a receiver and/or a provider of goods and services, covering cooperation and social aspects. We also asked why interviewees went OOM in that particular case and how similar they felt to the other party, and whether they would ever use the service again after doing so. We also asked about additional OOM transactions they had engaged in.

### Participants

Participants were US residents, recruited from a database of 1000 respondents to past surveys (who gave permission to retain contact information) and some convenience and snowball recruiting. We obtained 112 valid survey responses (some were discarded for non-completion or obvious cheating). Survey respondents ranged in age from 22 to 70 and were skewed towards a higher level of education (75% with bachelor's degree or higher, compared to the US average of 28.8%). This skew may reflect a combination of sampling bias and who in the population has knowledge of and participates in the peer-to-peer economy (which requires a PC or smartphone). Of the 112 respondents, 97 (86.6%) had participated in P2P transactions. Of the remaining 97, 58 (60% of the 97) claimed to have engaged in at least one OOM transaction and of these, we interviewed a randomly selected subsample of 22 individuals (aged 23-62) in more detail about their experience.

### Analysis Approaches: Quantitative and Qualitative

Our data analysis approaches were as follows.

**Survey—Quantitative Analysis:** We performed descriptive analysis and statistical tests, including:

- *Exploratory factor analysis* to find correlates of OOM transaction frequency and number of transaction partners (in other words, 'outcome' measures of the amount of OOM activity respondents engaged in).
- *Regression analysis* on the relationship (identified in factor analysis) of correlates to the outcome measures.
- *Paired t-tests* on (i) trust of- and on (ii) subjective similarity of respondents to- partners in P2P transactions versus partners in OOM transactions. The latter was to determine whether homophily might be greater between OOM partners than typical P2P transaction partners.

**Interviews—Qualitative Analysis:** Interviews received a high-level open coding treatment, similar to the 'grounded theory' approach [58] combing through transcripts to develop analytical themes. We explain our approach in more depth as a preamble to presenting our findings.

### QUANTITATIVE SURVEY FINDINGS AND DISCUSSION

### Prevalence for and Justification of Out-Of-Market Transactions

The first finding of interest is the prevalence of OOM transactions compared with P2P transactions amongst our informants. Figure 1 provides a breakout in terms of reported approximate frequency by 97 P2P service-using respondents, including those that did not engage in OOM transactions. From these reports, it seems the frequency of OOM transactions is not high as prior work, especially social exchange theory, would suggest [30, 16], but nor is it negligible; 33% of the respondents reported transactions taking place less than once a year, 20% between once a year and once a month, 3% reported their occurring between once a month and once a week and 4% between once a week and once a day (compared with 24% reporting P2P transactions for the same frequency range). Figure 2 shows
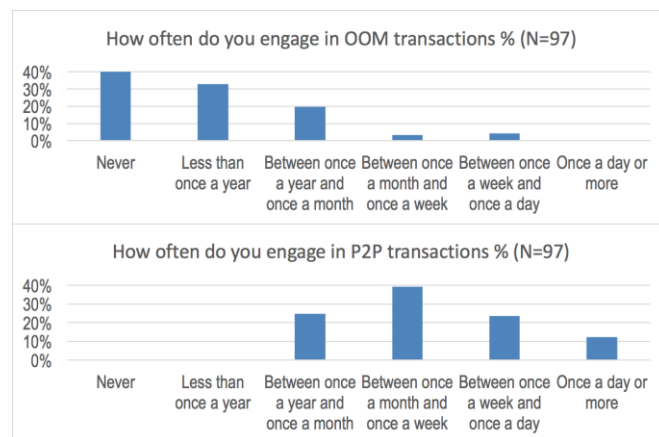


**Figure 1: Breakout charts of count of percentage of responses to frequency questions for P2P versus OOM transactions**
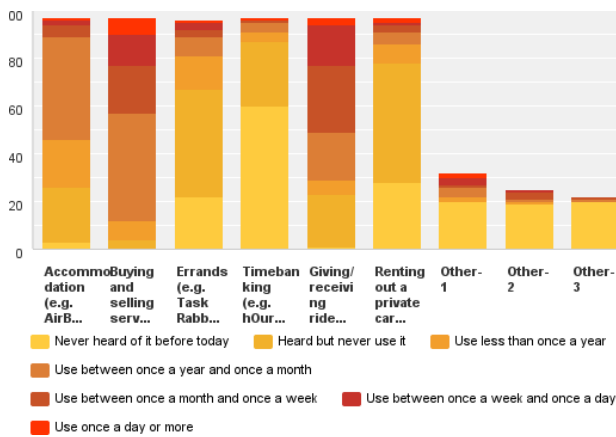
**Figure 2: Frequency % (Y-axis) of use of types of service reported by 97 respondents who engaged in P2P transactions. Few responses to "Other" were given, suggesting categories have good coverage.**

types of services respondents reported using and how much.

Motivations for participating in OOM transactions were surveyed. On a scale of 1=strongly disagree to 7=strongly agree, participants tended to "agree a little" with *efficiency*, *economy*, *comfort* (less awkward) and *trust* motivations, but were neutral about being motivated *to be friends* and "disagreed moderately" with *romantic attraction* as a motivator (we will return to the friendship motivation later).

**Correlates of Out-Of-Market Transactions**
Our survey covered many measures that might correlate with OOM transactions. In order to pinpoint measures for deeper analysis, we carried out an exploratory factor

| Regression Analysis | Coeff | Adjustd R2 | F | DF | Bonferroni corrected p< |
|---|---|---|---|---|---|
| FreqCooperate versus (Vs) FreqArrangeOOM | 0.26 | 0.09 | 10.5 | 95 | p<0.05 |
| FreqFormConnection Vs FreqArrangeOOM | 0.53 | 0.31 | 44 | 95 | p<0.00000005 |
| FreqFormRelationship Vs FreqArrangeOOM | 0.62 | 0.41 | 67.5 | 95 | p<0.00000001 |
| FreqCooperate Vs HowManyDiffPeopleOOM | 0.65 | 0.06 | 7.1 | 94 | p<0.1 (marginal) |
| FreqFormConnection Vs HowManyDiffPeopleOOM | 1.66 | 0.33 | 47.5 | 94 | p<0.00000001 |
| FreqFormRelationship Vs HowManyDiffPeopleOOM | 1.61 | 0.30 | 42.5 | 94 | p<0.00000001 |
| TypeUsedBuySell Vs FreqArrangeOOM | 0.30 | 0.10 | 11.6 | 95 | p<0.01 |
| TypeUsedBuySell Vs HowManyDiffPeopleOOM | 0.55 | 0.03 | 3.9 | 94 | p=0.5 (not sig) |
| TypeUsedTimeBank Vs HowManyDiffPeopleOOM | 0.63 | 0.03 | 3.9 | 94 | p=0.5 (not sig) |

**Table 1. Results of linear regression analysis on 7-point scale responses concerning frequency of cooperation, frequency of forming a connection, frequency of forming a relationship in OOM, using a buying and selling service and using a timebank with frequency of OOM transactions and number of people respondents had engaged in OOM with. N=97.**

analysis. Factor analysis, reveals underlying factors of co-variance of multiple measures and is a good way to quickly detect promising correlations between variables included in the analysis.

*Situational Factors*
The most important factor in our analysis F1, explained 10% of the survey item variance overall and had four item loadings with values of over 0.6 (which means they can be regarded as reliable, despite the small sample size ([21], page 647). They were all on a frequency scale of 1=never to 7=more than once a day and were:

1. **Frequency of Arranging OOM Transactions**
2. **How Many Different People Engaged in OOM With**
3. **Frequency of Forming a Connection** (i.e., retaining contact information) with a transaction partner (a situational factor [SF]).
4. **Frequency of Forming a Relationship** (i.e., develop feelings of liking or respect) for a transaction partner (also a SF).

**Frequency of Cooperating** with a transaction partner (same scale and also a SF) also loaded marginally (0.37) on F1. Other loadings could not be considered significant.

To obtain significance levels, for the relationship between the OOM outcome measures (1. and 2. above) and the three other measures above, regression analyses for each of these interactions was carried out with mainly significant or highly significant results (see the upper six tests, shaded blue in Table 1). To compensate for the number of tests performed increasing the possibility of spurious significant results, we applied Bonferroni correction to all regression analysis significance levels. The results confirm those of the factor analysis with strikingly high significance.

To sum this all up in plain English, statistical analysis of survey data suggested that:

- *Forming connections* and *relationships* and, to a smaller extent, *cooperation* are *situational factors* that are associated with **OOM transaction frequency** and *number of different OOM partners*.

Significant correlations cannot show that connection- and relationship-forming *cause* OOM transactions, but confirm an association. However, quotes from an open-ended survey question about specific examples of OOM suggest that the technologies that support *connection*-making—email and texting and/or cellphone calls—tremendously lower the barrier to reconnection when a similar transaction is desired, for example (our bolding of communication medium added): "*I have contacted, via **email**, Buyers who have purchased through eBay and paid through PayPal to purchase a similar item.*" Also "*For babysitting and petsitting, I usually **text** instead of going through Care.com after I've met them.*" And "*Used Uber and later that week needed ride but **called cell number** directly.*"

Since we averaged frequency of usage of all types of service (a situational factor – SF) in a single measure in our factor analysis, we broke the data apart and ran separate regression analyses to determine whether any are more prone to OOM transactions. The types were:

- Accommodation (e.g. AirBnB, Couchsurfing)
- Buying and selling service (e.g. eBay, Etsy, Freecycle)
- Errands (e.g. Task Rabbit, Agent Anything)
- Timebanking (e.g. hOurworld, TimeRepublik)
- Giving or receiving a ride (e.g. Lyft, Uber)
- Renting out a private car (e.g. RelayRides, Getaround)

Only use of *Buying and Selling Services* (e.g., eBay) was significantly correlated with OOM Frequency and marginally correlated with number of partners (see Table 1) as our prior work would suggest [11]. *Timebanking* was also related (p<0.01) to number of OOM partners and we draw attention to this result even though it is less compelling [47] because OOM transactions have been mentioned as a serious problem for timebanks in prior work [7]. This left **connection-** and **relationship-forming** as the two standalone but overwhelmingly significant correlates of OOM transaction frequency and number of partners.

### Trust and Homophily

A paired t-test on 58 respondents' ratings of trust (a situational factor [SF]) with P2P transaction partners (mean=5.21, sd=1.18) versus with an OOM partner (mean=5.81, sd=1.00) was highly significant (t = -3.79, df = 57, p=0.0004; p<0.005 with Bonferroni correction).

We were also interested in whether people tend to transact OOM with people whom they feel more similar to (the homophily principle [45, 60] and yet another SF). We asked respondents to our survey to indicate how similar they felt to transaction partners in typical P2P transactions and in OOM transactions. Similarity was indicated in terms of *Age*, *Thinking*, *Behaviors*, *Culture* and *Economic* traits. A MANOVA analysis for significant interactions between these variables in normal P2P versus OOM transactions gave a marginally significant outcome ($\wedge_{Pillai}$=0.09, F(5, 110)=2.05, p=0.078. Note that N here is only 58, since only a subset of respondents engaged in OOM). Digging deeper into the data, using separate paired t-tests, we find that *Thinking* alone is rated as significantly more similar between OOM partners (mean rating=5.09, sd=1.14) than typical P2P partners (mean=4.60 sd=1.06; paired t-test, t=-3.22, df=57, p=0.002, equivalent to p=0.01 with Bonferroni correction).

So, to sum up these two analyses, our data suggest that:

- **Trusting** and feeling one **thinks similarly** to one's transaction partner(s), are situational factors that correlate with OOM transactions.

But recall that people were *not motivated* to participate in OOM transactions *by the prospect of making friends*, rather trusting and feeling one thinks similarly to another may be a

precipitating circumstance for forming a connection and possibly a relationship of (presumably) mutual regard, which may facilitate OOM transactions.

### Personality Traits (Predisposing Factors)

We administered the 'big five,' [27, 28] and *kindness*, *trustfulness* and *dutifulness* [35, 36, 37] scales in our survey and, in our factor analysis, none of these loaded on the same factor (F1) as more frequent OOM transactions and more OOM transaction partners. This suggests no direct relationship between personality type and OOM transactions. However, we saw scores on the personality trust scale *PersonalityIPIPTrustScale* loading strongly on the same Factor (F2) as *TransactionPartnerTrustLevel*. Regression analysis showed a very high correlation (Adjusted $R^2$ =0.26, F=34.31, df=95, p<0.0000001, N=97) yet, curiously, given the results of the paired t-test on trust above, no statistical relationship held between the personality trait of trustfulness and engagement in OOM transactions, even though trust is implicated in OOM. This result merely (and somewhat obviously) seems to show that the IPIP trust scale is predictive of people reporting being more trusting of others.

So, as far as predisposing personality factors go, we found:

- No **evidence of any predisposing personality factors** associated with OOM transactions.

Our quantitative findings are quite consistent with the theories we discussed in our related work. Rational Choice Theory [31, 55], Equity Theory [1, 2], Social Exchange Theory [31, 16], Behavioral Game Theory [11] and Reciprocity Theory [63] would all tend to predict that forming connections and relationships, and cooperating with transaction partners would increase the opportunities for and utility of OOM transactions where the partners can each benefit at the expense of the P2PM. This would tend to depend on trust of partners which was implicated in our analysis, which in turn tends to be fostered by homophily, again implicated in our analysis.

So, as prior work has suggested [25, 46], situational factors seem to be predictive of OOM transactions, but the intuitively selected personality traits we studied were not. On the other hand, we have not proved that there are no individual differences in economic behaviors, as the Equity Construct Theory proposes [33], our findings simply suggest that such dispositional differences may not be tied to the personality traits which we included in our survey.

While social situational factors seem to facilitate OOM transactions, these cannot explain much beyond the fact that they foster trusting, informal arrangements. We now delve into the specific motives that lay behind recalled experiences of switching to OOM transactions versus remaining in a P2PM, which we elicited in our interviews.

| Motive Psychological Root | Common Term (From 345 quotes coded with multiple motives (some expressed none)) | Why Choose P2P | | | Why Choose OOM | | |
|---|---|---|---|---|---|---|---|
| | | MP2P-All | MP2P-Prov | MP2P-Rec | MOOM-All | MOOM-Prov | MOOM-Rec |
| Value/Morality | Self-improvement/Integrity (reduce guilt & hypocrisy) | 2% | 0% | 0% | 2% | 7% | 0% |
| | Society/Community/Utopia (a better world for all) | 2% | 0% | 0% | 0% | 0% | 0% |
| | Environment/Sustainability | 0% | 0% | 0% | 0% | 0% | 0% |
| | Simple Morality (it's just the right thing to do) | 2% | 8% | 0% | 13% | 7% | 11% |
| Social influence | Norm (internalized influence; social proof) | 0% | 0% | 0% | 0% | 0% | 0% |
| | Reciprocity (internalized morality, fear of disapproval) | 0% | 0% | 0% | 20% | 14% | 22% |
| | Persuasion (extrinsic influence, pressure from other) | 2% | 0% | 3% | 76% | 86% | 63% |
| Power/Status | Self-improvement/Increased power (future instrumentality) | 2% | 0% | 3% | 4% | 7% | 0% |
| | Reputation/Status/Social capital (future instrumentality) | 9% | 0% | 14% | 2% | 7% | 0% |
| Empathic/Altruistic | Help/Provide service to other | 6% | 25% | 0% | 42% | 64% | 26% |
| | Give something to other | 2% | 8% | 0% | 7% | 7% | 4% |
| Social connection | Social connection/Relationship (desire for friendship, etc.) | 9% | 8% | 10% | 20% | 7% | 26% |
| Autotelic/Intrinsic | Amusement/Happiness | 0% | 0% | 0% | 2% | 7% | 0% |
| | Compulsion (e.g. addiction, competition) | 0% | 0% | 0% | 0% | 0% | 0% |
| | Engagement/Interest/Curiosity/Flow | 0% | 0% | 0% | 2% | 0% | 4% |
| Safety | Safety | 100% | 92% | 86% | 2% | 7% | 0% |
| Instrumental | Payment | 26% | 67% | 3% | 40% | 93% | 15% |
| | Get service/thing | 63% | 33% | 93% | 62% | 43% | 63% |
| | Increase value/Increase convenience | 89% | 100% | 100% | 100% | 100% | 100% |
| | Decrease burdens/Decrease inconvenience | 35% | 42% | 38% | 27% | 43% | 15% |
| **Disincentives** | | **Why Not P2P** | | | **Why Not OOM** | | |
| Ethical and/or concern/sympathy | E.g. Uber driver doesn't earn enough | 27% | 27% | 13% | 25% | 50% | 31% |
| Threat to status/reputation | E.g. Risk of poor review or rating | 0% | 0% | 0% | 0% | 0% | 0% |
| Social pressure | E.g. Client suggests dropping out to save money | 0% | 0% | 0% | 0% | 0% | 0% |
| Distrust/Discomfort of Stranger | E.g. I don't know this house guest enough to trust him | 15% | 0% | 38% | 3% | 0% | 8% |
| Privacy | E.g. Not wanting a corporation to collect data about me | 8% | 0% | 13% | 0% | 0% | 0% |
| Punishment | E.g. Ban from using service, legal penalties | 0% | 0% | 0% | 9% | 33% | 0% |
| Material loss/Financial loss | E.g. A customer might not pay, or a guest might steal | 100% | 100% | 100% | 100% | 100% | 100% |
| Inefficiency/Inconvenience | E.g. Hard to find a vendor, writing address labels is hard | 38% | 9% | 88% | 22% | 33% | 23% |

Table 2. Counts of motivation- and disincentive-type codes from quotes about choosing to stay on P2P platform, versus going out-of-market. Columns represent 'All' motives, provider (Prov) motives, and receiver (Rec) motives broken out for comparison. For greater ease of comparison, the highest number of code counts in each column is represented as 100% and the other percentages in that column are proportional to the highest number in that column (motives and disincentives treated separately).

## QUALITATIVE INTERVIEW FINDINGS AND DISCUSSION

We organize findings from 22 interviews, around quantified coded qualitative data (Table 2). Our coding process, involved a motivation framework-based coding scheme building on our prior work on motivations for participating in P2P marketplaces (P2PMs) [6]. Starting with that framework, we extracted 345 quotes from the 22 interviews and assigned codes to the quotes. However, while coding, we realized we needed new codes for *disincentives* mentioned by informants. Table 2 lists the meanings of the codes rather than the codes themselves with motivation framework from [6] above and our new disincentive codes below. Anywhere from 0 to 6 codes were assigned to each (sometimes quite lengthy) quote and, through repeated team review over 6 months of weekly coding meetings, our team reached agreement on the codes used for each quote.

In Table 2, we show the relative importance of motivations and disincentives, comparing P2P with OOM. In the following sections, we examine the meaning of the relative importance of motives and disincentives for staying in a P2PM versus going OOM. Note that interview participant ID numbers, given with quotes, were assigned at survey time, so they went up to P (for participant) 112, not P22.

### Instrumentality: Increasing Value and Decreasing Loss

Code counts are clustered around the same motives and disincentives for both P2P *and* OOM. Increasing value or convenience and avoiding material or financial loss (echoing [14, 15, 41, 57, 59, and 65]) are the main drivers. One example is the following justification for going OOM from P14, an Airbnb guest; *"I was supposed to go on vacation and unfortunately I had to cancel but I already paid for the place. There was no way to get a refund for that particular stay [...] The value of the contract was over 300 euro. I asked them to work with me to find possibilities on how we could resolve the situation and make it possible for me to come there and perhaps stay with them outside of Airbnb since they already got the money."*

Similar motivations for *staying in* the P2PM are illustrated by an eBay vendor, P105 who wanted a convenient financial return to fix a potential loss of utility; *"So I had this bathing suit that didn't fit, that I couldn't return it. [...] I was able to post it online in like two or three minutes [...] So I started an auction for that item [...] And I compared it to similar items that had been sold recently and put the "buy it now" like at that average price [...] So it was gone in like 36 hours [...] it was pretty good."*

Whether it is P2P or OOM, individuals make a calculation as to how best to maximize their returns and minimize losses, just as the economic behavioral theories presented in our related work section would predict [16, 30, 31, 55].

Based on that same theoretical work, especially Behavioral Game Theory [11], we argued that, over a succession of repeated transactions, development of a trusting collaborative relationship would create a situation where the rational thing to do would be to negotiate for an OOM arrangement to increase the value for both of the transaction partners (see Table 2) by cutting out the P2PM. Our quantitative analysis suggested this and our qualitative analysis backs this up. P28, a WyzAnt tutor illustrated this tendency very well; *"I think it was about three or four months we did transactions online and then afterwards they just said let's work out a system. I think that WyzAnt has got enough of our money. I want to make sure that you get a little bit more, but also we're saving a little bit more. So we negotiated a fair price and then I think we agreed that I will continue tutoring. I actually continued tutoring with them for two or three years, I can't remember. And they just started paying me in cash instead."*

Notice that the client was cited as making an appeal to fairness, saying that *"WyzAnt has got enough of our money"*, implying an unspoken but justifiable limit to the value the service can be said to have contributed in making the introduction between tutor and student, as Equity Theory and other work would predict [1, 2, 17]. P28 also appeals to fairness as the basis for determining the new OOM tutoring rate (fairly sharing the savings [1, 2, 63]).

Our main finding around utility is that similar but highly variable economic factors (including diverse motives and disincentives) drive whichever choice (in- or out-of-market) is made. Such factors are predicted by theories of rational economic decision making covered in our related work, with the particulars depending on the situation of the transaction (i.e., what intuitively seems fair in that specific context, balancing many considerations at once).

*Ethics*
A less important common factor for both P2P and OOM transactions was ethical disincentives. In the case of disincentives for P2P transactions, ethics tended to be related to a sense of unfairness about the size of the commission a P2P platform provider gets, predicted by equity theory [1, 2] and reciprocity theory [63], as P114 put it; *"For me, obviously there are concerns, but I don't think* [drivers] *make enough money and I do think that Uber takes too much. So I feel, it's hard for me sometimes to, I don't know how to explain it that I feel bad. I feel bad using Uber. I feel bad that I couldn't hail a yellow cab because I feel like I'm participating in a kind of predatory business structure. But it also meets my needs, so I mitigate that with just the reality of the fact that it's convenient and it's how I need to get home right now."* Note that, in this case,

though, the disincentive conflicts with and is crowded out by stronger, self-serving utility motivations.

Ethical disincentives for going OOM tended to be associated with assuming (without necessarily checking, because almost no one reads the small print [5, 27]) that the P2P platform provider has rules against going OOM that should be respected, as P01, speaking about P2P services in general, stated; *"Now, you know, unwritten rules of course are that, once there's someone that built that service that gave me the opportunity to use that service — seamlessly […] made it basically easy, the first time, for me to find such a service. I respect that and I try to not go outside the service or, you know, that's basically the modus operandi when I use these kinds of services. […]. One instance when this* [going OOM] ***could*** [P01's emphasis] *happen is when you're out of money or when you need something repetitive and I don't know or it's something very delicate, I don't know, like you had someone doing the plumbing work and they did a good job, then, obviously, there's no need for you to go through that service again…"* And, again, we see the ethical disincentive can be outweighed by important instrumental needs, should they come into play.

P20, an Airbnb host was more adamant about ethics; *"P20: It's more just that, if I ever got audited yeah I, in general… or they got audited, I just don't feel it's right everything… it's kind of a moral issue, keep it in the system…"* And indeed, it was P2P *providers* who were more likely to voice moral objections to OOM transactions (see Table 2), we infer that this is because it aligns with their self-interest and they have more to lose than receivers (the P2PM is a major source of their income) should they be caught transgressing. Again, complex utility calculations and commitment are implicated which, as Social Exchange Theory suggests, involve optimizing across many diverse considerations.

*Safety and Trust: Guarantees and Reputation Systems*
The biggest differentiator between P2P and OOM motivations, for both providers and receivers is "Safety" (see Table 2) in that P2P platforms often provide many guarantees that OOM transactions lack. Participants felt secure in the knowledge that if something went wrong with a P2P transaction, they would be compensated by the platform provider. P96, an Airbnb and HomeAway service receiver stated; *"[…] because Airbnb and HomeAway, they give you that guarantee. So for renting a room for a few days, for a week, we are talking about a couple of hundred, a few hundreds, maybe even a thousand dollars. You just want to be covered in case there's something shady going on."* Lampinen and Cheshire [41] describe P2PMs as 'translucent brokers' that facilitate transactions and help to resolve conflicts. We build upon this, noting that once a transaction partner has been found, the P2PM's guarantee of protection from material loss or danger is as great a motivator as the additional convenience it provides.

Safety not only depends on financial compensation and other service guarantees, it also arises from the ability of

the platform to aggregate other users' experiences in the form of ratings and recommendations, in other words, reputation systems [38, 50]. These allow participants to better evaluate risks of transacting with specific individuals:

*"So that's how you figure [...] whether or not it's safe to stay with someone [...] If x amount of people have stayed with them and said positive things about them. So the first thing that you will do is [...] you will search for [...] the people who have the highest number [...] of positive ratings, usually at the top."* P85 a Couchsurfing guest.

OOM transactions happen, in spite of the risks, when partners trust each other, but trust is only an enabler, not a motivator, so it does not appear in Table 2. On the other hand, *distrust* does appear in Table 2 as a *disincentive*, even *within* P2P marketplaces since they introduce strangers to each other. Echoing findings in [48], P108 stated; *"the larger an online service where I make peer-to-peer transactions gets, the less trustworthy I find the greater proportion of their sources."* This highlights the flip-side of the key advantage that P2PMs have, in giving users an ever-larger pool of strangers to transact with; some prefer to transact OOM with partners they previously found through the platform, whom they have now come to trust.

Trust may be established in situations where positive social interactions generally occur, or over the long-term in situations where participants gain experience of fair play by remembered specific transaction partners [42, 48]. P94, an eBay vendor gave an excellent example of this; *"So there's just so many like, you know, stores here, there's a lot of fairs here, [...] I just have access to things that people in other parts of the country or the world don't. And that's how we become kinda friends. So people would say, 'Hey if you want it if you find something,' [...] I'll find it I know someone has an interest, let's say in, say, David Bowie, and they'll just give me the 50 bucks for it instead of me going on eBay, and it saves me money so I don't have to pay eBay anything, and I'll just show it to 'em because they trust me, and I trust them."* Here, P94 demonstrates commitment (as in Social Exchange Theory [16, 30]), as he works to strengthen customer relationships with considerate favors.

### Social Pressure: Persuasion and Reciprocity

The second notable differentiator in motivations between P2P and OOM is social pressure. We never heard about anyone being coerced, instead pressure tended to come in the form of a suggestion (gentle pressure) as in; *"... he was a very friendly guy and engaged in a conversation with us [...] and maybe half way there. He mentioned to us that he was going to the city as well and he could take us there [...] and he said he could turn off the meter when we got to the BART station and we would just pay him like a flat rate and I think we paid him the bridge toll, which was five dollars and then maybe an additional five dollars to just drop us off at the airport because he was going out to the city anyways to work for the night and we thought it was a good deal so*

*we decided to just take it because he seemed really friendly."* P21, Uber rider.

Notice that in this case, again, P21 and the driver negotiate an equitable arrangement [1, 2, 63] that compensates the driver for going a little out of his way to the airport (near the freeway). Reciprocation is also occurring although it is not P21's motivation for the OOM the transaction in the first place, rather it is the driver's suggestion, probably facilitated by P21's liking for him.

In another case from P14, a Lyft rider, reciprocity [63] became a powerful motivator for an OOM transaction, since the driver would have lost $30 due to a technical malfunction; *"So then we kept going and then we got to our house to get out and he, like, tried to end it but it said that there was no ride. And he was, like, he just – he was flustered and I was with my boyfriend and I was, like, 'Oh wait, we'll just pay you cash.' But my boyfriend was like hesitant, he's like, 'I don't think we're supposed to that.' I was, like... well it was, like, a $30 ride or something."*

Notice here that, despite P14's willingness, her boyfriend is concerned about breaking the relatively powerful platform provider, Lyft's, rules, but, since we were not interviewing him, we cannot know whether he had an ethical motivation or just fear of getting caught breaking those rules. Later on, it turned out that the boyfriend's card was charged after all and, after negotiations with Lyft, the company refunded the payment with strict instructions never to give cash to drivers again. Interestingly, this left P14 with an altruistic motivation to help Lyft by staying on their platform; *"Yeah, I think that – after, in retrospect, I think that totally make sense because I think if any cash transactions go on, it could really like jeopardize the reputation of Lyft."*

### Empathy/Altruism

Another differentiator between motivations for OOM and P2P transactions can be seen in Table 2 around empathic and altruistic motivations, specifically in relation to helping or providing services for others (rather than giving things to them). This motivation was generally *amplified* by more self-interested instrumental utility motivations, as described in [41], and was most apparent for providers, as with P10, an uGuru tutor; *"I'd rather not have to renegotiate every single time that I'm not with a new student to understand [...] what she's really struggling with and how much is he willing to pay and what is usually a good time for us to meet and study together. So, if you have a return customer, you have a better understanding of how you can help her, what is the best time to do it. So it makes it... from a perspective of tutor transaction, cost is also cheaper. [...] I think I let her have all the reduced cost. It's okay because she was having, for that student, for my first student, she was having a lot of trouble and she was seriously going to fail that course."* So in this case, P10 gained the self-serving convenience of not having to find and accommodate a new student, at the same time as being motivated to help his customer.

Receivers also experienced empathy and altruism mixed in with other motives, for example an Uber and Lyft service receiver P95 stated; *"I had a situation where the driver wasn't [...] something happened with the meter or something like that and I ended up just giving him money and I don't know if he, you know, what he was supposed to do with it or not and I basically told them I didn't really care [...] because he was, you know, he had kind of given me a deal and that it wasn't running the way it was supposed to so I saved a lot of* [crosstalk] *in doing it and he would've made no money had I just, you know, left or something like that."* In this case, P95 has again not followed the P2P service's policy, with the apparent plight of the driver in-the-moment motivating him to pay outside of the system. Whether or not the driver was really experiencing a technical problem or trying to make a better deal outside the P2PM is not clear, but major motives for P95 appear to be a combination of social pressure, reciprocity and empathy for the driver, although there was also the amplifying motive of the savings for P95 in not paying the P2P platform commission for this ride.

## GENERAL DISCUSSION AND CONCLUSIONS
Our aim in this research was to understand the precipitating factors for choosing whether to remain in a P2PM or to go OOM. We found *no evidence* to suggest that certain *personality types* are predisposed to OOM transactions. Rather what we found, statistically, was a set of correlated circumstances that seem to be associated with OOM activity; the *formation of connections and relationships*, possibly associated with *cooperation*, and perceived *similar thinking* and *trust*. It is just such circumstances that one might expect would foster coming to a mutually beneficial agreement to transact informally once a suitable partner is found and this is consistent with behavioral economic theories of the type discussed in our related work. This finding is also consistent with prior work which places greater emphasis on circumstantial factors than personality factors in explaining human behavior [25, 46].

In our qualitative analysis, we delved deeper into specific motivations that were at play and these certainly highlighted a diversity of circumstantially sensitive drivers that make OOM transactions attractive, or even socially awkward to avoid. The main drivers are instrumental or self-serving motives and disincentives, again, as predicted by behavioral economic theories. But, as predicted by more advanced and nuanced theories such as social exchange theory [16, 30], these are mixed with and tempered by many different considerations such as ethics, safety and trust, social pressure, reciprocity, and empathy or altruism.

Prior work has identified the motivation to make *social connections* as a significant driver for the P2P economy [6, 64], but our study does not support it as a factor in the *choice between* OOM and P2P transactions since *both* are highly social. On the other hand, our work builds upon prior work finding that social connections are a draw for P2PMs

[6, 14, 15, 41, 64] strongly suggesting that the formation of connections and relationships and, to a lesser extent, collaboration with transaction partners *lay the groundwork for OOM activity*, even if social connections are not a distinguishing motivator. So, a major factor that makes P2PMs an attractive alternative to conventional services is also its Achilles' heel because it also fosters OOM activity.

### What Can/Should Platform Providers Do?
Based upon our analysis, we find that P2PMs offer technical and service advantages over going OOM by offering a greater range of possible transaction partners, supporting finding the right one quickly and offering great convenience in terms of handling transaction details such as delivery, payment and tracking. They are also perceived as safer in general, since they typically handle breakdowns well. Whilst P2PMs should continue to improve on these natural advantages, aspects of transactions where they need to compete more with, or tolerate, going OOM is in:

- Giving users (generally receivers) *assurance* that they will get a *high-quality service or product*, which is partially but not fully addressed by reputation systems, since a reputation may be absent or might be manipulated (e.g. in a tit-for-tat exchange). A past transaction partner who provided a good service or product soon becomes a target for OOM transactions if uncertainty about quality is generally an issue.
- *Avoiding charging too high a commission* for transactions as users (generally providers) will perceive this to be unfair and act to rectify the unfairness by persuading customers to cut the P2PM provider out of a share of the rewards for a transaction.
- *Continuing to support rich social interaction*, even though it leads to the risk of OOM transactions, since this is a major motivator for using P2PMs in the first place, and gives users control over their own choices.

### Limitations of Our Study
Before closing, we should emphasize that this research was based on a relatively small and skewed population of individuals (although we cannot tell if the skew is non-representative of P2PM users). For this reason, the findings should be taken as suggestive, not definitive, and further research is required to determine whether our results generalize to other samples. Intriguingly, though, we have found that this somewhat better-educated-than-average sample has many members admitting to disintermediating the P2P platforms that they use—and not infrequently—by which we mean using them to find partners and then turning systems off or using alternative means of conducting transactions. We have no reason to believe that less well-educated individuals would be less likely to turn to OOM transactions when it makes sense for them to do so.

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