MTurk Character Misrepresentation: Assessment and Solutions

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Character Misrepresentation by Amazon Turk Workers: Assessment and Solutions

CONTRIBUTION STATEMENT

Consumer researchers conducting studies with Amazon Mechanical Turk Workers ("Turkers") often screen respondents to focus their research on a particular group of respondents based on demographics (e.g., age, gender, marital status), particular health problems (e.g., acne or sleeplessness) or behaviors (e.g., smokers, type of employment). Relying on self-reports to qualify respondents for studies can result in bad science if large numbers of respondents are not who they say they are. This tutorial demonstrates that as many as 80% of those who complete a study for MTurk credit misrepresent their identities, their demographic characteristics, or what they own in order to qualify for studies. We show the rate of misrepresentation is particularly problematic when attempting to sample a rare population. Additionally, responses from impostors to questions other than the qualification question can to be different from those of respondents who truly qualify for the study. Substantial distortion occurs when respondent can gain financially by misrepresenting, but importantly not when monetary reward is not offered. We delineate how online MTurk worker communities and websites can help or hinder data quality. For studies where the qualifications are central for the study validity, we recommend inviting respondents screened at an earlier step where they cannot gain from the distortion. Furthermore, we recommend that a researcher or behavioral lab could benefit from creating and managing an ongoing MTurk participant panel of consistent and reliable respondents. Because understanding the needs and resources of the Turkers community is important, we detail ways that those doing consumer research can both help and be helped by appropriate design, promotions, and management of MTurk studies.

ABSTRACT

This tutorial provides evidence that character misrepresentation in survey screeners by Amazon Mechanical Turk Workers ("Turkers") can substantially and significantly distort research findings. Using five studies, we demonstrate that a large proportion of respondents in paid MTurk studies claim a false identity, ownership, or activity in order to qualify for a study. The extent of misrepresentation can be unacceptably high, and the responses to subsequent questions can have little correspondence to responses from appropriately identified participants. We recommend a number of remedies to deal with the problem, largely involving strategies to take away the economic motive to misrepresent and to make it difficult for Turkers to recognize that a particular response will gain them access to a study. The major short-run solution involves a two-survey process that first asks respondents to identify their characteristics when there is no motive to deceive, and then limits the second survey to those who have passed this screen. The long-run recommendation involves building an ongoing MTurk participant pool ("panel") that

(1) continuously collects information that could be used to classify respondents and (2) eliminates from the panel those who misrepresent themselves.

Keywords: Amazon Mechanical Turk, deception, panel, screener questions, theory-driven sample

Character Misrepresentation by Amazon Turk Workers: Assessment and Solution

Character misrepresentation occurs when a respondent deceitfully claims an identity, ownership, or behavior in order to qualify and be paid for completing a survey or behavioral research study. For a large number of marketing studies, the need for accurate screening is critical for the effective understanding of market behavior. Goodman and Paolacci (2017) articulate the need for *theory-driven samples*. For example, a study about uterine cancer treatment options makes little sense if it includes males.

Our own interest in this topic came from three experiences while engaging in research with Amazon Mechanical Turk (MTurk) participants:

- The authors needed a large number of respondents who frequented burger-related fast food restaurants at least once a month. Out of the 1,754 Turkers who passed a 3-question screener, 149 did so by making multiple attempts at passing the screener questions. Another 100 made multiple attempts but were not able to figure out the combination of answers that would permit passage (Wessling, Netzer, and Huber 2016).[1]
- The second author ran two conjoint studies seeking ways to help patients explore and communicate their wants and needs with their physicians. Smokers over 50 qualified for a study of lung cancer treatments, while active athletes under 35 qualified for a study of shoulder dislocation treatments. Seventeen percent of respondents in the cancer study had the same Worker IDs as those in the shoulder study[2] (Tong et al. 2012).

[1] While "prevent ballot box" stuffing was selected in this Qualtrics study, multiple attempts at a study can be made if a participant clears the "cookies" from their web browser or simply switches browsers.
[2] A Worker ID's is a unique identifier for each MTurk worker.

- The third author asked for Turkers who had written over 10 reviews on Yelp to complete a study. Almost 900 Turkers began the study and all but 33 dropped out when they were asked to provide a screenshot that verified their qualifications.

These disturbing examples mirror similar cases reported by Chandler and Paolacci (2017) demonstrating consistent distortions in responses when MTurk participants are able to retake a screener or falsify their identities in order to complete a study. Our goal is to identify the degree of misrepresentation in paid MTurk studies and its implications on the legitimacy of the scientific inquiry. We then propose a two-step process to achieve appropriate theory-driven samples. The first step assesses a respondent's qualification in a context where the respondent has neither the motive nor the requisite knowledge to deceive. The second step then makes the study available and viewable only to those shown to qualify in the first step. Finally, we detail ways that this two-step method be incorporated into a larger panel creation and management process that enables research with known and trusted MTurk respondents.

Amazon Mechanical Turk provides the focus in this tutorial on misrepresentation because Turkers provide the dominant source of web-based studies for those studying consumer behavior (Goodman and Paolacci 2017). However, similar deception may occur on other crowdsourcing platforms, professional marketing research panels, or in-person studies. For example, a person interested in being a part of a focus group about diaper brands (paying $150) may claim to be a mother with young children when in fact she is not (Leitch 2012). Thus, our recommendations are also relevant to other online and offline respondent recruiting platforms. While the problem is not limited to online studies, it may be particularly higher in this context given one is more easily able to misrepresent oneself in the anonymity of an online environment.

There are four key lessons from this tutorial. First, we demonstrate that MTurk workers are willing to misrepresent themselves to gain access to a desired study and that those who do so generate distorted responses to other questions in the study. Second, we show that the level of character misrepresentation is negligible when there is no economic motive to lie. Third, we characterize the role of online Turker communities, demonstrating how the goals of MTurk workers interact and sometimes conflict with the practices and values of the consumer behavior research community. Finally, we evaluate various measures to prevent misrepresentation, arguing that traditional measures of response quality are not very useful, but need to be replaced by a two-step process that separates the character identification from the study itself. Details on the mechanics are provided in the web appendix.

There are a number of issues related to using MTurk respondents that are only briefly mentioned in this tutorial because they are well covered elsewhere. The important issue of the representativeness of the Turkers community to different populations has been extensively explored by other researchers (e.g., Berinsky, Huber, and Lenz 2012; Goodman and Paolacci 2017; Paolacci, Chandler, and Ipeirotis 2010; Ross et al. 2010). We also do not cover attrition rates due to study manipulations that can distort research conclusions such as a writing task in one condition, but not the other (Zhou and Fishbach 2016). Finally, we do not explore the disturbing finding that people who complete many social psychology research studies become non-naïve, and are thus differentially affected by specific manipulations, various forms of memory tasks, and attention checks (Chandler, Mueller, and Paolacci 2014; Chandler et al. 2015).

Testing Character Misrepresentation

We begin with a series of two-stage tests that assess the extent to which Turkers misrepresent themselves when they have a motive and opportunity to do so. In the first stage, respondents provide their demographic characteristics, activities, and product ownership in a context that does not offer any monetary incentive to misrepresent nor does it provide any information on the desired response. In the second stage, a screener question permits respondents to alter their answers from the first-stage questions in order to take a new study. Comparing respondents' answers across stages allows us to assess the degree of misrepresentation and the extent to which Turkers provide distorted answers to subsequent questions. We also compare these results to a simple take/retake group to separate misrepresentation from reliability in survey response.

Stage 1: collecting panel characteristics. To assess character misrepresentation, we first built a panel with "true" characteristics and activities including product and pet ownership from 1,108 Turkers located in the United States. These questions were spread across eight different surveys that asked about (1) political and religious affiliations (MoralFoundations.org), (2) moral beliefs (MFQ: Graham et al. 2011), (3) material values (MVS: Richins 2004), (4) personality trait importance (GSA: adapted from Barriga, Morrison, Liau, and Gibbs 2001), (5) extroversion and agreeableness, (John and Srivastava 1999), (6) personality (TIPI: Gosling, Rentfrow, and Swann 2003), (7) product ownership (i.e., sports and technology), pet ownership (e.g., dog, fish, cat, etc.), food consumption (Sharpe, Staelin, and Huber 2008), health consciousness (Gould 1988) and social desirability bias (Crowne and Marlow 1960), and in the final survey, (8) willingness to compromise moral beliefs (MFSS: Haidt, Graham, and Joseph 2009). The specific contents of each survey are outlined in web appendix A; however, a thorough analysis of this data goes beyond the scope of this tutorial.

All eight surveys were launched simultaneously so that any MTurk worker could take as many surveys as desired within the first hour of posting. At the end of the hour, any worker who had taken one or more of the panel surveys became a "panelist" and gained access for the next four weeks to take any of the uncompleted eight surveys.[3] Only those identified as panelists could see or take the panel surveys after the initial one-hour cutoff. On average, our panelists completed 7.1 panel surveys out of the eight available.

Each panelist saw a consent form at the beginning of each first- and second-stage surveys. The consent form notified respondents of the possibility that their answers from other studies could be linked through their unique MTurk Worker ID, and if participants did not agree to these terms, they could exit the study. Including this consent form has implications as respondents who expected to cheat may question whether they wanted to complete the survey or study, and thus, might drop out of our panel. However, we found the dropout rate to be minimal. Across eight surveys with more than a thousand respondents, 96 respondents abandoned a survey with only 16 of these occurring at the consent form stage.

Stage 2: Testing misrepresentation. We conducted five studies to determine the extent to which participants altered earlier responses to qualify for a study. As detailed in web appendix B, the studies differed in terms of screening requirements and the questions asked in the body of study. Only panelists were permitted to view the MTurk HIT (i.e., Human Intelligence Tasks) description and participate. In this second stage, the invitation described the general topic of the study (e.g., product-related study, health-related study, pet food survey) and

[3] This was accomplished through using the MTurk qualification functionality. We created a qualification type called "qual" and set this value to "1" for every panelist (see the appendix for details). We also batch notified our panelists of other surveys that they were eligible to take using the 'R' package 'MTurkR' which may have contributed to the high response rate (see appendix E).

whether it would be restricted to those with certain characteristics. We provided this detail to respondents for two reasons. First, in treating potential respondents ethically, analogous to many lab situations, we informed potential participants of the requirements so they could freely choose to take the study (Gleibs 2016). Second, because Turkers often complain about "unpaid" screeners, for four out of our five studies, we informed them of the qualification requirements a priori so they would not waste their time if they did not meet the requirement. If participants chose to accept the task, they clicked on a survey link and viewed the consent screen indicating that their responses could be tied to other studies. Once respondents passed the screener and the study questions, they entered a unique completion code in order to be paid. Thus, our two-stage design allows us to assess the extent of misrepresentation when Turkers are given the opportunity to do so.

In discussing these studies, we concentrate on the degree of character misrepresentation and the distortion in responses to subsequent questions. We focus on responses that were statistically different between those who were and were not impostors. Later sections examine the contexts in which strong misrepresentation occurs, the role of Turker communities and norms, and we finally end with a discussion of possible solutions to character misrepresentation in MTurk studies.

The five studies screened respondents on (1) owning a cat and/or a dog, (2) owning a kayak, (3) being over 49 years old, (4) being raised Catholic and (5) being female. In all studies, we define impostors as those who provided the requested response in the screener question that differed from their response in stage 1. It is important to control for possible alternative explanations for inconsistent responses between the two stages such as take/retake reliability error and change in status or character between the two surveys (e.g., someone may have

purchased a kayak in between the two phases in our sports equipment related study). We do so by including in four out of the five studies a "control" condition in which the screener question was included as part of the survey but not as a screener. The proportion of inconsistent responses between stage 1 and stage 2 in the control condition, where the focal question was not a screener, assesses differences that are due to random inconsistency or change in character status but not due to misrepresentation.

Table 1 provides for each study the percent of the first stage panelists who had the qualification requirement when there was no incentive to lie (column A), and the percent of respondents in the second stage who alter their earlier response to enable them to take the study (column B). That shows unacceptable rates of misrepresentation ranging from 24% to 83%, with greater rates occurring when there are relatively few Turkers who can honestly respond to the screen (low rates in column A). Because the proportion of possible misrepresentation is "capped" at the proportion of respondents who are "eligible" to do so, we report (column C) the proportion of impostors (column B) divided by the proportion of respondents who are "eligible" to do so (1-column A). This measure gives us a "standardized" degree of misrepresentation. Looking at column C, we see misrepresentation of around 80% for the pet and kayak ownership, but around 50% for age, religious upbringing, and gender. This suggests that respondents are less likely to deceive with respect to stable, identifiable demographic characteristics compared to product ownership, which is more difficult to disprove. We encourage future studies to further explore the kinds of screens that are more likely to encourage misrepresentation.

Column D gives the inconsistency rates in a control study where there was no screen and thus no motive to impersonate. We see a baseline inconsistency of 0%-4% when there is no

motive to deceive. That baseline inconsistency is important in providing the prime justification for screening in a separate survey.

Table 1: Character Misrepresentation in Studies With and Without Screeners.

Study	Qualification Requirement in B	A: Panel Survey: % of initial panel who satisfy screen (a)	B: Screened Study: % of Paid Respondents who alter initial response to satisfy screen (b)	C: Deceivers % who alter relative to those who are "eligible" to imposter (b)/(1-(a))	D: Control: % of Paid Responses who alter response when there is no screen
Pet Food Study I	Must own a dog OR a cat	70% (n=1000)	24% (n=378)	80%	NA
Pet Food Study II	Must own a dog AND a cat	19% (n=1000)	71% (n=123)	88%	NA
Kayak Study	Must own a kayak	7% (n=1000)	83% (n=146)	89%	4% (n=96)
Fiber Study	Must be 50 years old or older	13% (n=999)	43% (n=141)	49%	0% (n=144)
Politics Study	Must have been raised Catholic	30% (n=1034)	39% (n=120)	56%	4% (n=138)
Cellphone Case Study	Must be female	49% (n=1041)	25% (n=141)	49%	0% (n=154)

We now describe each of the studies and the differences in responses between those who did and did not misrepresent themselves. Web appendix B provides the details of each of these studies.

Pet ownership test. We ran two tests related to pet food brands, with the first test requiring participants to have at least one dog *or* cat to qualify and the second test requiring at least one dog *and* one cat. Upon entering the second stage tests, participants were asked to complete a screening question about pet ownership. If they reported having the required number (independent of whether they report the correct answer in the first stage survey), they were

shown the consent screen and permitted to take the study. Otherwise, they were told that they did not qualify and could not continue.

Examining table 1, 70% of the respondents indicated that they had either a dog or a cat in the first stage. In the second stage, 24% out of the 378 respondents who completed the study altered their earlier response to gain access to the study. By contrast, for the more restrictive qualification, 19% of the responses in the initial surveys indicated they had both kinds of pets, but in the second stage, 71% out of 123 respondents who completed the study changed their pet ownership response to qualify. Both levels of misrepresentation are unacceptable, but clearly the greatest risk occurs for the more restrictive screens.

Many of the subsidiary questions did not differ significantly between the respondent who misrepresented and those who did not. However, when given a list of 15 national brands of pet food and asked which one(s) they actually purchase for their pets, impostors were significantly more likely to claim that they purchase a national brand compared to the outside alternatives, either the "none" option or the store branded food (dog food: 90% vs 82%; $p = .033$; cat food: 94% vs 84%; $p = .004$). Across our studies, we often found that impostors are significantly less likely to choose the "none" option. One possible explanation is that impersonators want to appear knowledgeable and involved and hence are less likely to go beyond listed brands.

These results are disappointing in demonstrating substantial levels of misrepresentation and significant differences when it comes to study responses. While unlikely to explain the entire result, two possible explanation for the difference between the stage 1 and 2 pet ownership questions is changes in the pet ownership in the two months or take/retake errors in response to the survey questions. In the pet food studies, we did not account for the fact that the respondent may have acquired a pet during the two months between the stages. To assess the degree to

which inconsistencies between the two studies may be attributed to such accounts, in the next studies we include a control group that received the same survey without any screeners. Responses from the control group also measure the fundamental variability in the response to the screening variable across stages.

Kayak ownership test. Kayak ownership was determined in stage 1 by asking about respondents' ownership of sports equipment, and 7% of our panelists checked a box indicating that they currently owned at least one kayak. Thus, in this study, due to the relatively low ownership of kayaks reported in the first stage, 93% of the respondents to the first study had "an opportunity" to deceive. Two months later, a second stage study was posted saying it was just for kayak owners. Once past the consent screen, panel members chose again among the same sports equipment options as in stage 1 and were permitted into the paid study if they checked that they owned a kayak. Of the 146 respondents in stage 2 who indicated that they currently owned a kayak, 132 (88%) had indicated earlier that they did not. However, seven participants also indicated that they had recently purchased a kayak, which leads us to conclude that at least 83% of stage 2 participants were clear kayak owner impostors.[4]

Because only 18 respondents reported both in the first and second stages that they owned a kayak, this study did not provide a sufficient sample size to compare the response of impostors and consistent respondents to other questions. Instead, we asked respondents to report their kayak ownership with no incentive to imposter (take/retake) and found that only 4% of those who reported to have a kayak in stage 2 did not report to do so in stage 1. This may be due to the purchase of a kayak between the two studies (although no one indicated that they had recently

[4] Note that respondents also had an incentive to lie about acquiring a kayak in between the studies to justify their inconsistency between the two studies.

purchased a kayak) or due to response inconsistency. Thus, we can conclude that the vast majority of the change in response to the kayak ownership question between the two surveys is due to intentional misrepresentation and not merely inconsistency in response.

Dietary fiber for those over 50. In the first stage, 13% of panel respondents indicated that they were over 50 years old or older. In the second stage, the recruiting statement explicitly stated that only those 50 and over would qualify. Upon entrance to the survey, participants viewed the consent screen and reported their age. Those who said they were 50 or above were permitted to take the study. There was substantial age misrepresentation with 43% of the 141 stage 2 respondents being revealed as impostors. To make sure that the stage 2 age screen was not due to take/retake error, we ran the study again without any screen and 100% of the 144 respondents in the control condition reported an age bracket that was perfectly consistent with the age reported in stage 1.

Among other questions, participants made a choice of a fiber supplement among Metamucil Tablets-100 ($15.99), Fiber Well Gummies-90 ($14.99), Benefiber Powder-125 ($25.99), and a "none" option. The impostors, with an average age of 33, were significantly less likely to choose the "none" option relative to those who legitimately passed the screener (8% vs 25%; $z = -2.567$, $p = .010$). They also overstated their average vitamin frequency (ranging from never = 0 to daily = 3) compared to those legitimately over 49 years old ($M_{\text{impostors}} = 2.36$; $M_{>49} = 1.96$; $F(1,140)$, $p = .036$). Thus, we find that not only do respondents misrepresent their age, but more importantly, those who impersonate exhibited different responses to other questions, leading to biased survey results.

Raised Catholic as a youth. In the first stage, 30% of panel members indicated that they had a Catholic upbringing. The second stage recruiting statement specified that only those raised Catholic could take the study. Once in the survey, if respondents indicated in the screener question that they were not raised Catholic, the study ended and they were not compensated. However, if they claimed that they were raised Catholic, they completed the study and were paid regardless of whether their claim matched their first stage response. Then participants were shown an excerpt from a CNN article (Burke 2016) reporting a controversy between Pope Francis and Donald Trump and asked if they agreed with the Pope's statement that "A person who thinks only about building walls, wherever they may be, and not building bridges, is not Christian" (Strongly disagree = 1, Strongly agree = 5).

Of the stage 2 respondents, 61% of the 120 participants consistently matched their earlier statement that they had been raised Catholic, while the other 39% contradicted their earlier response about their religious upbringing. For comparison purposes, we re-launched the study with no screener and only 4% of 138 respondents changed their reported religious upbringing in a take/retake study when there was no monetary incentive to misrepresent. Furthermore, we found that those raised Catholic were statistically more likely to agree with the Pope's statement than the impostors ($M_{\text{Catholic}} = 3.93$; $M_{\text{impostors}} = 3.38$; $p = .028$).

Woman's cell phone cover conjoint. The final experiment tests gender misrepresentation and includes a standard conjoint task. In the first four studies, the unscreened "control" condition was launched after the screening condition; thus, differences between control and screen may have been due to selection effects given those who had previously taken the screener version of the study were excluded from taking the control relaunch. To mitigate such possible selection effects, panel members for the cell phone study were randomly assigned to a screen or

no-screen condition, both of which ran simultaneously. As shown in table 1, 25% of the 141 respondents in the screener condition changed their reported gender to gain entrance to the study. By contrast, none of the 154 respondents in the unscreened condition changed their gender identities.

All respondents completed twelve choice-based conjoint tasks selecting among cell phone case designs. As shown in an example task in figure 1, the attributes and levels for the alternatives included color (pink, black, or navy), style (slim design, ultra slim profile, or easy on/off of the case), drop protection (included or limited), radiation protection (included or limited), and price (ranging from $29.99 to $59.99).

Figure 1: Example Choice Task from Conjoint Exercise for Females

Table 2 summarizes the conjoint estimates. We found that males posing as females statistically differed from true females on the stereotypically female attributes of color and design. Specifically, males impersonating as females had higher estimated utility (part-worth)

for a pink cell phone case ($M_{females}$ = -0.53; $M_{impostors}$ = 1.85; p = .013) with an ultra-slim cover ($M_{females}$ = 0.40; $M_{impostors}$ = 1.09; p < .0001) compared to actual females surveyed. Those misrepresenting their gender also had a higher utility value for the none option ($M_{females}$ = -3.43; $M_{impostors}$ = -1.70; p =.043) and chose the "none" option more often than females ($M_{females}$ = 7%; $M_{impostors}$ = 13%; p = .013). Thus, this results contradicts the earlier finding that that impostors are less likely to choose the "none" option. However, examining the control condition, males imposing as females had marginally lower utility values for the "none" option compared to males not in the take/retake condition. That result is consistent with our previous findings that those who impersonate tend to be more averse to choosing the none option compared to those who are being honest (M_{males} = -0.06; $M_{impostors}$ = -1.70; p = .088). There was no reliable difference in utilities on the less stereotypically female attributes (i.e., drop and radiation protection) between males in the control condition and males imposing as females.

Table 2: Partworth Utilities for cell phone case study for Impostor Males, Females and Non-Impostor/Control Males[ŧ]

Attribute Level	Male Impostors N = 35	Females n = 180	Males N = 80
Color: pink (relative to a black) case	1.85 (std err=1.00)	-0.53** (std err=0.37)	-8.72*** (std err=0.52)
Design: Ultra-slim (relative to the easy on-off) case	1.09 (std err=0.10)	0.40*** (std err=0.06)	0.44*** (std err=0.09)
Radiation Protection: relative to not included	0.66 (std err=0.10)	0.94** (std err=0.05)	0.72 (std err=0.06)
Drop Protection: included relative to not included	2.18 (std err=0.26)	2.85** (std err=0.11)	2.29 (std err=0.17)
The "none" option	-1.70 (std err=0.76)	-3.43** (std err=0.34)	-0.06* (std err=0.53)

[ŧ] Difference with male impostors is significant *** p < .001, ** <.05, *<.1

Conclusions from the five studies

The five tests demonstrate that studies using screeners which rely on respondents' self-reports are susceptible to an unacceptably large proportion of impostors. In particular, we find

that from 24% to 83% percent of those passing the screen are impostors, and that deceit occurs in 49%-89% of those who are "eligible" to misrepresent. The risk of misrepresentation is greater for narrow or rare screening categories and when the characteristics misrepresented is flexible like ownership rather than inflexible demographics. Thus, we can conclude that without safeguards, misrepresentation can be destructively common.

Further, those who pretend to be someone else may use one of three different strategies in answering other questions from those whom they are mimicking. First, impersonators may be reluctant to admit their lack of knowledge and thus may be less likely to choose the "none" response as occurred in all but the conjoint study. Second, those who misrepresent may attempt to project to what they expect the persona they impersonate would think, and in doing so over emphasize stereotypes. That appears to happen with male impostors improperly projecting that women prefer pink cell phone covers. Finally, where projection to a different person is difficult, deceivers may simply default to their own personal views or preferences. That may have happened when those misrepresenting their Catholic upbringing were more likely to disagree with the Pope than actual Catholics. The important point here is that there are various ways a deceiver may continue to deceive, and it is very difficult to predict the direction or magnitude of the bias.

The good news from our tests is the strong evidence of minimal distortion when there is no economic motive to do so. That occurred in the control studies having less than 5% inconsistency between the stages when there was no screener needed to gain entry into the study. This high degree of take/retake reliability among Turkers is reasonable, simply because telling the truth is easy, while deceit takes effort. It also speaks to the fairly high internal validity of MTurk responses. Before examining how one mitigates this threat to the validity of studies, it is

important to understand the roles that web forums have on Turkers' behavior and particularly on the likelihood of addressing deception.

Online Turker Forums and Deception

Given the significant number of impostors in our test studies, we were interested in the potential role that online Turker communities have in either encouraging or discouraging deception. Table 3 provides a list of the major Turker forums.

Table 3: Online Turker Communities

Name (website)	**Registered Users**[5]	**Open to the Public? (need for registration)**
MTurk Forum (MTF) (http://www.mturkforum.com/)	54,831	Yes (no registration to view)
Hits Worth Turking For (HWTF) (https://www.reddit.com/r/ HITsWorthTurkingFor)	35,626	Yes (no registration to view)
MTurk Reddit (MTR) (https://www.reddit.com/r/mturk)	20,146	Yes (no registration to view)
Turker Nation (TN) (http://www.turkernation.com/)	17,891	No, this is a private site. Requesters may sign-up but receive limited access
TurkerHub.com (TH) https://turkerhub.com/	12,408[6]	Yes (no registration to view)
Turk Opticon (TO) (https://turkopticon.ucsd.edu/)	No user information published	Yes, (need to register)
MTurk Crowd (MTC) (http://www.mturkcrowd.com/)	2,740	Yes (no registration to view)

[5] As of 12/20/16

[6] *Turker Hub* was previously *MTurk Grind* (MTG) at http://www.mturkgrind.com/ which had 12,408 registered users. User information for the newly created TurkerHub.com has not been published. However daily views (by registered and non-registered users) range from 8,984 to 46,213 (Mean 18,855) during the second month of this forum's inception.

A number of researchers have documented the frustration and difficulty associated with being a Turker (Dholakia 2015; Martin et al. 2014). MTurk online forums have been created by Turkers and serve four primary functions to limit that frustration. First, the websites help Turkers select desirable HITs by including estimates of actual pay per minute (which can differ from the estimated pay rate) and any warnings about difficult, boring (e.g., "bubble hell"), or "tricky" tasks (e.g., attention checks, memory checks). Second, and most relevant to the current discussion, some threads make suggestions on how to pass qualification screens. Using self-reported data, Chandler, Mueller, and Paolacci (2014) suggest that this behavior does occur but the extent of this distortion is unknown. Third, these forums provide a place for venting anger or frustration with requesters or other Turkers. Fourth, the forums encourage coworker friendship, which includes discussions of personal challenges that may or may not be related to completing MTurk tasks (Brawley and Pury 2016). Table 4 provides example quotes (some edited for clarity) that gives a sense of how such MTurk communities operate.

Table 4: Online MTurk Discussion Examples

Community Purpose	**Example quotes from the sites**
Help passing screen	*Must be in a romantic relationship to pass screener.* (HWTF)
Attitude towards unpaid screeners at the beginning of a study	*Unpaid screener. So sick of this crap, I wasted time reading the survey info.* (MTC) *It's an annoyance. Requesters put up an unpaid screener, ask you enough questions to qualify as a paid survey, and then tell you that you aren't eligible. There really shouldn't be unpaid screeners - it gets abused and turned into mini-surveys.* (HWTF) *I don't hate [unpaid screeners], as long as they're short, and not buggy. Ideally, they should also tell you that they have one, up-front.* (MTR)
Help with avoiding attention and memory checks	*Two attention checks, One requires you to recall a price, one requires you to write a word.* (HWTF) *I always copy/paste whenever I see large blocks of text in case there is a memory check (this should not be considered cheating despite what others may say).* (HWTF) *I was filling out a survey, failed an attention check, but I was able to retake the survey. Can requesters honestly see when Turkers do this?* (MTF)

Help selecting HITS	*Six and a half utterly unenjoyable minutes, but monetarily a HWTF.*[7] (HWTF) *This one made me feel anti-social. Bubble hell warning.* (HWTF)
Processing advice	*I setup a macro using iMacro for each [option]. The attention checks are the same for a few days at a time so it comes down to how fast you can click one of the macro choices once you learn the pattern.* (MTG)
Focus on speed	*Finished a $4 hit in less than 10 minutes so I decided to milk the timer. I've been rejected for going too fast but I'll milk the timer on a new requester who is over paying for hits, hoping that it will make them less likely to drop the pay. If they're paying $4 and see people submitting hits in 8 minutes, the pay probably gets drastically reduced for their next hit.* (MTG)
Socialization	*Husband's birthday is on Tuesday and I'm like $30 short of having enough to get him what I want to get him Trying to get surveys done but not real hopeful of much getting approved over the weekend.* (TH) *I work outside the home 2 full jobs and Turk between. After a while it became easy to stay awake for a few days at a time without even getting that sleepy. Now I have to drug myself to even fall asleep.* (TC)
Attitudes towards requesters	*I am feeling like I need a mindless batch today. Very upset this morning to receive a rejection on a survey, emailed and asked why...they said I went too fast to have taken it seriously. I do all of the surveys carefully....I guess I need to let the clock play out.* (TH) *I wish Amazon's "improvements" would include a Block Requester option.* (MTC) *Terrible Requester. Seems to reject everybody. The goal of this character seems to getting surveys done without actually paying.* (TO)
Unintentionally revealing different stimuli conditions	Warnings about the same study: *Thread 1: 2 minutes writing* *Thread 2: No writing in the version I did* (HWTF)

MTurk community websites can thus generate problems for researchers by revealing experimental conditions, by undermining tests of respondent abilities or knowledge, or by enabling character misrepresentation that permits a person to enter a study under false pretenses. It is important to note that such forums not only increase the risk of deception in studies but may also serve as a safeguard against such deception. For example, we conducted a 12-cent study with 736 Turkers who were asked to guess the number of gumballs in a jar with the ability to

[7] A HWTF ("HITs Worth Turking For") is any task which pays 10 cents or more per minute to complete. It is based on the actual time that a Turker took to complete the task and not the posted time by the researcher.

"win" a $1 bonus if they guessed correctly. After each respondent made a guess, we revealed the correct number of gumballs. We monitored whether the proportion of Turkers guessing the number correctly increased over time as well as the activity on MTurk forums to see if the correct answer was posted online. Indeed shortly after posting the study, a correct answer appeared briefly on *HITsWorthTurkingFor* (HWTF) notifying fellow Turkers of the response that would lead to the $1 bonus. However, the post was criticized and taken down by the forum moderator within minutes (the screenshot shown in web appendix C). As a result, relatively few people (3.8% of respondents) "guessed" the correct answer. Thus, while a small level of deception occurred, the moderator served to limit its impact by reinforcing norms of Turkers being reliable respondents.

A major function of the forum websites is to provide greater worker power. In particular, Turk Opticon (TO) was created to try to restore some balance of power between the workers and requesters. The TO platform allows Turkers to rate requesters and comment on the HITs that they post based on four dimensions that workers care about: "communicativity," "generosity," "fairness" and "promptness." While separate from the MTurk platform, anyone may review the individual ratings from the TO site. Those with a Turker account may also load a browser script from Opticon which automatically generates the requester's aggregated Opticon scores and simultaneously displays these scores while browsing for HITs on MTurk.

This drive for greater Turker control arose in part out of their perception that requesters are unfair because they have the ability to unreasonably "reject" or "block." Through Amazon's accept/reject functionality, requesters can reject a submission, and then not pay if a worker makes multiple attempts at a study, fails an attention check, does not submit the correct end-of-survey code, answers the survey too fast, or makes a submission but never completed the study.

This rejection leads to immediate loss in income and negatively impacts the worker's approval rating. Because requesters often set the requirement that Turkers have a particular approval rating (e.g., typically 95% or above), Turkers try to avoid anything that could hurt their rating. Further, a repeat offender may be blocked from all subsequent studies by that requester. Being blocked by several requesters can lead to the worker's account being suspended and barred from completing any MTurk tasks. As a result, workers are highly sensitive to those actions that threaten their ability to work. The forums allow Turkers to quickly identify and disseminate requesters who commonly reject Turkers. While the forums restore some of the balance of power between requesters and Turkers, they may also discourage requesters from appropriately rejecting or blocking truly offending workers from their studies. Additionally, researchers sometime do not reject or block offending Turkers because such processes require additional effort after the data collection has been completed. Instead, researchers are often motivated to quietly remove poor responses from their data. However, requesters who abstain from taking actions against deceptive Turkers may be hurting the research community by not punishing these offenders.

Overall, the MTurk online forums help workers transform a difficult job of responding to studies into one that is more predictable, pleasant, and economically justifiable. In that way, forums benefit requesters by increasing the willingness of people to participate in research studies. Forums also encourage requesters to act in ways that support the joint system. In particular, the forums penalize requesters who pay a low hourly wage (Gleibs 2016), those who under-report the expected length of the study, those who annoy workers with unexpected or boring tasks, and those who block workers unjustifiably (Brawley and Pury 2016).

In effect, online MTurk communities serve as an informal labor union (Bederson and Quinn 2011), whereby Turkers are able to lessen their efforts and improve their earnings through a collective system of notifying and warning fellow workers. As such, and as recently recommended by others (Cheung et al. 2016; Farrell, Grenier, and Leiby 2017), it is important for researchers to become familiar with these Turker communities and follow the chatroom discussions when a study is live. Doing so can help researchers evaluate how Turkers perceive the study, and whether their payment level is sufficient for the effort put into the study. It will also help researchers determine the extent to which screeners, attention checks, manipulations, or desired responses have been revealed to other Turkers.

Possible Ways to Minimize Character Misrepresentation

There are a number of ways to limit distortions from respondents who falsify their identities. We begin with a number of solutions that are either infeasible or impractical, and then move to describe a version of a two-step process which can reduce, if not eliminate, the opportunity for deception.

Disguise desired screener answers. Chandler and Paolacci (2017) have demonstrated that disguising a screener requirement reduces the amount of deception in MTurk studies. To make it more difficult for deception to occur, the screening questions should contain a number of items where it is difficult to determine which will grant access to the study. However, it is often difficult to disguise a screener even if the researcher adds a list of possible options, because the respondent may still answer the questions in a way that maximizes her likelihood of qualifying for a study. For example, a respondent may claim product ownership for all (or of a larger number of) products to maximize the likelihood of passing the screen. Furthermore, Turkers

often complain about being screened out of a study without being paid without prior warning. As such, studies with disguised screeners are susceptible to Turkers repeatedly taking the study (by clearing the cookies from their browsers) or to the leakage of screener criterion through the Turker communities.

Identify false qualifiers after the fact. Researchers commonly use attention checks or response time to screen respondents who are not sufficiently diligent (e.g., Peer, Vosgerau, and Acquisti 2014). Can similar approaches be effective for screening impostors ex-post? Suppose one suspects that respondents have misrepresented their identity. Is there a way to adjust for it after the fact? Can one infer from responses to other questions or response style whom are the respondents who lied to get into a study compared those who didn't? Unfortunately, the simple answer is no.

Consider first approval ratings. In our studies, we deliberately chose not to set an approval rating threshold so that we could assess the common requirement by researchers that Turkers have a 95% approval rating to take their studies. The self-reported approval ratings gathered in our panel surveys had a mean approval rating of 99.1% with only 1% of our panelists under the 95% threshold, making it a difficult criterion to separate impostors from those who answered honestly (Brawley and Pury 2016). Table 5 shows in the cell phone conjoint study that the average approval rating for impostors was 99.2% compared to a 99.1% approval rating for those who legitimately passed the screen. Indeed, across our five studies the average approval rating of impostors was not significantly different from those who did not.

Table 5 also gives the results for traditional quality metrics. It shows that there is no statistical difference for failed attention and memory checks between those who deceived and

those who honestly qualified in our cell phone study. Thus, including these in one's studies and either controlling for or eliminating those who fail these checks does not weed out impostors. Turkers, in general, are very good at detecting traditional attention checks (Farrell, Grenier, and Leiby 2017; Hauser and Schwarz 2015). There was also no difference in how much time one spent on the study between impostors and those who legitimately qualified. Finally, impostors and those who qualified did not differ in regards to conjoint fit statistic, RLH (Sawtooth Software 2013, p. 22). It appears that impostors are just as practiced and vigilant as honest Turkers.

Table 5: Conjoint Study Quality Comparison

Quality Check	**Impostors** (n = 35)	**Respondents who satisfied the screen** (n = 106)	**significance**
Failed Attention Check	0.0%	4.7%	$\|z\| = 1.362$; $p = .173$
Failed Memory Check	11.4%	6.6%	$\|z\| = .492$; $p = .622$
Approval Rating	99.2%	99.1%	$\|t\| = .464$; $p = .643$
Total Time on Study (minutes)	5.61	5.70	$\|t\| = .100$; $p = .921$
Conjoint Fit (RLH)	0.74	0.77	$\|t\| = 1.136$; $p = .258$

We do find some demographic differences between those who impersonate and those who are honest. There is preliminary evidence that extroverts ($p<.001$) and males ($p<.001$) on MTurk have a higher propensity to impersonate, but it would certainly not be desirable to remove everyone who fits these characteristics from a research study.

Pay all respondents without screening. We demonstrate that misrepresentation occurs rarely if there is no benefit from doing so. Therefore, if one is interested in a selected group for pragmatic or theoretical reasons, a feasible solution is to simply collect information from everyone and statistically control for, or remove, undesired respondents from subsequent

analyses. That strategy requires payment to unneeded respondents but has the advantage of providing information about the effect of individual differences. This approach is particularly attractive if the base-rate of the screened population is relatively high. However, if the base-rate proportion of the screened populations is low (e.g., people suffering from a particular disease) this approach can be prohibitively expensive. Still, one can limit wasted participants by moving respondents with undesired characteristics into other studies where those characteristics are desired. In a medical study, for example, those respondents 40 and over could take the lung cancer study while those under 40 could take the shoulder dislocation study.

Use a commercial panel to deliver prescreened respondents. Companies like Qualtrics and SSI, provide access to prescreened panelist. However, these vendors tend to cost orders of magnitudes more than managing the process oneself. Typical fees in 2016 are $20 per completed 15-minute study compared with $2 with MTurk. The price charged is generally much higher for rare populations. There are emerging enterprises such as *TurkPrime* (Litman, Robinson, and Abberbock 2016) and *Prolific Academic* (ProA) that allow screening for a lower fee. Thus, we can expect the cost per respondent to decrease. However, while these commercial companies claim confidence in their prescreening, they offer little external verification. We encourage researchers who use such services to monitor and validate the quality of the screening. It is important for these organizations to test their panels just as our two-stage process tested the MTurk workers.

Recommended Two-Step Approach

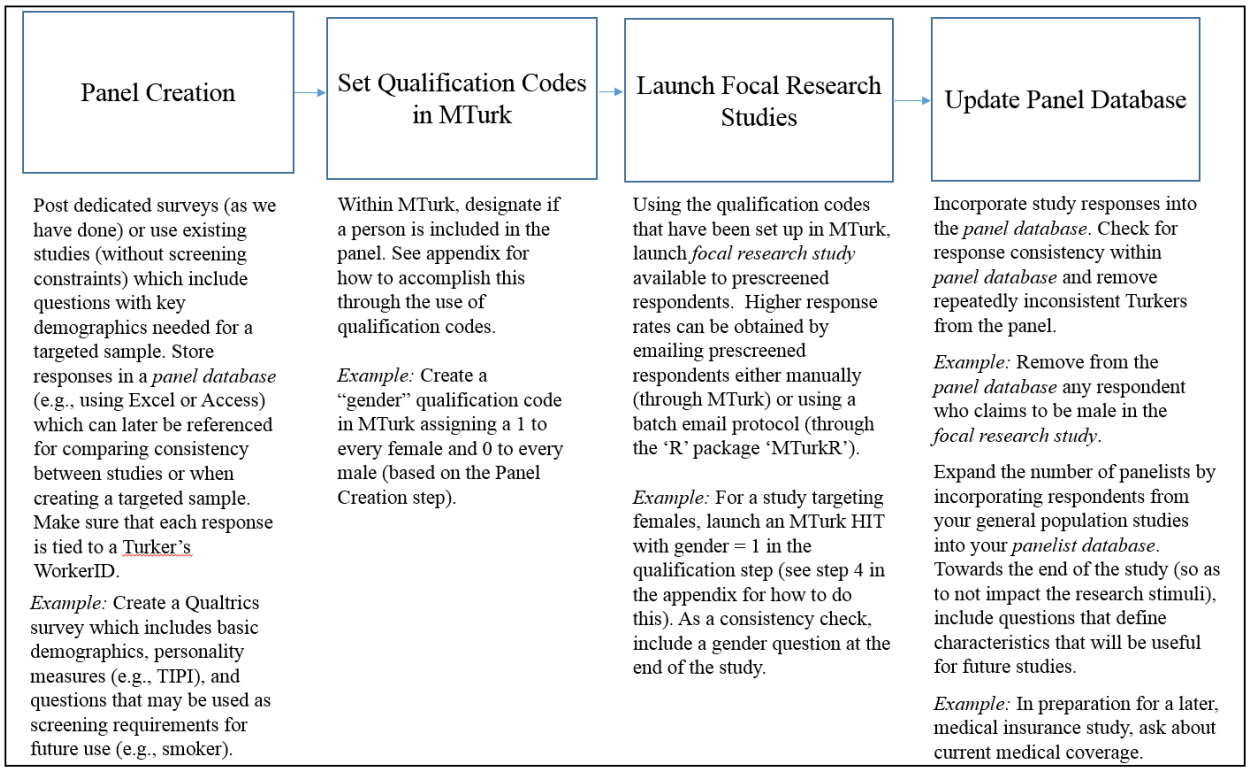
We believe that prescreening participants before the focal study is the best way to reduce the expense of a study and limit the number of impostors. We first explain a one-off approach

within MTurk and then describe a way to create and manage a panel of qualified respondents across multiple studies or researchers administered by a behavioral lab.

Run a short paid prescreen. Researchers can run a prescreen questionnaire to establish who will be appropriate for a subsequent test, perhaps involving a simple $.10 survey with a few quick questions. As mentioned above, it is important that the prescreen not be part of the actual study. If the actual study is desirable because it is highly paid or interesting, it is likely that the desired qualification conditions will be posted on an MTurk forum or that Turkers will attempt to retake the study. Additionally, it is important that the screening question be masked by other questions. For example, if one looks for respondents above a particular age or that own a particular product, the researcher should ask a few demographic and multiple product ownership questions in the paid prescreening questionnaire.

Develop an ongoing panel. Researchers who conduct multiple studies or coordinated studies within a behavioral lab setting could gain substantially by building an ongoing panel similar to the one that we used to test the extent of misrepresentation. Figure 2 provides a flowchart for creating and managing such a panel. The panel could begin as in our studies with general questions to define a number of critical screening variables. Because any panel will gradually lose members over time, it is useful to include categorization questions in all studies that build information for future studies and test respondent consistency with earlier ones. With such a panel, studies that needed a targeted population would only be made available to prescreened panel members. Even so, we recommend that a consistency check in the focal research study be included. For example, in a study where only females are permitted, we recommend including a gender question in the demographic section as a way to check for consistency with the initial panel response.

Figure 2: Panel Creation and Management Process



However, it would also be useful to allow a relatively small number of non-panel members to take open studies to gradually develop and replenish the panel with new participants. It is also helpful to test panel members in various ways. For example, Chandler and Paolacci (2017) asked whether respondents own a brand that does not exist, or if they have rare diseases or do unlikely activities. Asking questions about impossible activities or fictitious events can help identify opportunistic, long-term, consistent deceivers. Notice, however, that such questions should be used with caution as Turkers are likely to catch on, especially if the question can be factually verified (Goodman, Cryder, and Cheema 2013).

It is useful in setting up a panel to build a centralized repository for study responses. While a single researcher could easily manage such a data set in Excel, a robust system with more complex database management could emerge as part of a behavioral lab. In the ideal case, all MTurk studies would be managed through a central MTurk account that uses "qualification"

codes to designate which Turkers would qualify based on prior responses. Web appendices D and E explain the mechanics of using qualification codes for creating and managing a panel. The 'R' package, 'MTurkR,' is useful in creating and updating qualification codes once the panel size becomes sufficiently large (Leeper 2017). This package is also helpful for sending batch emails to notify pre-qualified respondents that they are eligible for new studies. In this way, a researcher or lab coordinator can manage an MTurk pool, similar in nature to a professional panel company or student participant pool, while benefiting from the relatively low cost of using MTurk.

DISCUSSION

There are four goals to this tutorial. First, we demonstrate the extent to which character misrepresentation occurs when Turkers are given the opportunity to do so. Deceivers, having gained access to a desired study, distort their identities and can generate unstable responses to later questions. Second, we provide evidence that MTurk workers are very consistent when there is no motive to lie. Third, we explore the motivations and activities of Turkers as revealed by their comments on MTurk forums. We advocate and detail a two-step process where the first step is to identify appropriate respondents and the second is to target directly those who qualify. Finally, we recommend that this 2-step process be incorporated with a larger panel management system.

The fact that the results of MTurk studies depend on how each study is introduced and managed within the system implies that more effort is needed to document how a study is implemented and how respondents are recruited. Scientific progress requires others to be able to replicate a study, and as a field, we need to move towards including the kinds of detail shown in

table 6 as part of the study reporting. Of course, not all of this information is needed for every study, but such detail is appropriate in a web appendix to help the reader better understand and be able to replicate the work.

Table 6: Important Information to Report for MTurk Studies

Characteristics of the study as posted on MTurk
How were Turkers recruited to take the study (i.e., wording of the HIT description)?
The expected time to completion
Notification if there is an unpaid screener
Screening process
Was screening part of the focal study (unpaid) or completed as part of a previous study (paid)?
The exact wording of the screening question(s) and which options led to being screened out
Percent of respondents attempting to start the study but failed the screener
Completion history
Average and standard deviation of completion time
Date and time survey opened and closed
The number of times the study was posted/re-posted (i.e., study launched in micro-batches)
Attrition: percent of respondents quitting before the end of the study by condition
Avoiding multiple responses
Was a back button allowed?
Was prevent ballot stuffing implemented?
Micro-batches (if applicable): how were multiple responses prevented or screened out?[8]
Sample cleansing
Percent of respondents dropped due to failed attention, memory, consistency or speed checks
Were multiple attempts by the same respondents removed? If so, how many were removed?
Vigilance
Monitoring of specific MTurk communities
Reporting any discussion on MTurk communities which could be relevant to the research results

Perhaps the greatest lesson from recent work demonstrating the likelihood of deceit from Turkers is the need for constant vigilance on the part of researchers. Such vigilance requires a number of efforts such as including validation tests that ask the same question in different ways and checking for consistency. Unlike categorical and substantial lies, such softer inconsistency only suggests a heightened probability of deceit or undesired sloppiness. The question then

[8] Micro-batches are when a researcher launches the same study multiple times in order to achieve one's sample size. Each time the study is launched, the MTurk platform places it at the top of the queue of HITs and may result in faster completion times.

arises of the appropriate reaction on the part of a researcher who suspects that a Turker is behaving irresponsibly. One response is to reject the Turker's submission, something that will reduce the Turker's approval rating. Requesters may also "block" the Turker from taking future studies. Both solutions are quite effective in penalizing the individual Turker but can result in an unfair penalty for an honest mistake or inconsistency as well as negative reactions against the researcher if disseminated within the Turker communities. An alternative response is to remove the respondent from the panel, which eliminates the possibility that that respondent will contaminate future studies. Such actions are better for both the individual Turker and researcher in the short-term. However, the formal action of rejecting the submission or blocking the respondent from taking future studies provides a greater benefit to the entire research community which gains from holding our participants accountable for honest and dishonest responses. We encourage researchers to contribute to the community by flagging poor quality Turkers, but because such actions will have a direct effect on a Turker's source of income, we recommend doing so only when the dishonesty is clear and disruptive to scientific progress.

Finally, we build on Goodman and Paolacci (2017)'s tutorial in urging consumer behavior researchers who use MTurk workers for their studies to better understand these participants and treat them as important contributors to their research (Gleibs 2016). Thus, it is important that HIT descriptions help respondents find topics that they can manage well and even enjoy (Brawley and Pury 2016). Researchers also need to avoid the negative surprises from hidden tests that lead to frustration or anger. Ironically, strong positive surprises can also be distorting if they encourage respondents to misrepresent themselves to gain access. As a long-run proposition, we find that building a stable but continuously refined MTurk panel improves both parties. The MTurk workers gain from more regular and more predictable work from a

regular source, while the researchers gain from a loyal, dependable panel about which much is known before the study begins.

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Appendix: Using Qualification Codes to Create an MTurk Panel

This appendix is primarily focused on creating and using "Qualification" codes within MTurk for the purposes of managing a participant pool on MTurk. Qualifications are particularly useful in accomplishing the following:

- Designating your panelist: indicating which workers ("Turkers") are to be included in your panel (procedure described here).
- Pre-qualifying participants for a study: indicating if a participant (after taking a pre-qualifying survey meets certain requirements (e.g., respondent is female) for taking a future study (see web appendix E for procedure).
- Removing participants from your panel: This is a way to "soft block" participants from taking future studies (see web appendix E for procedure).

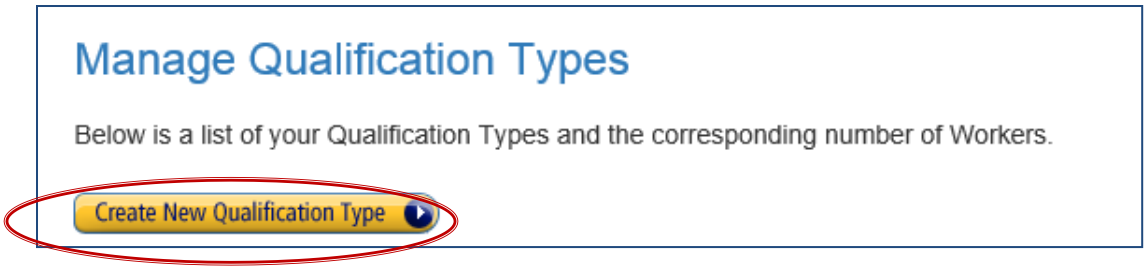
To create a panel using qualification codes within MTurk involves the following four steps:

1. Create a new qualification type (to be used to designate whether or not someone is in your panel)
2. Download the "Worker" file and assign Turkers to your panel
3. Upload the updated "Worker" file (which include your panelist designations)
4. Include your new panel designations as a "criterion" when launching a new MTurk study

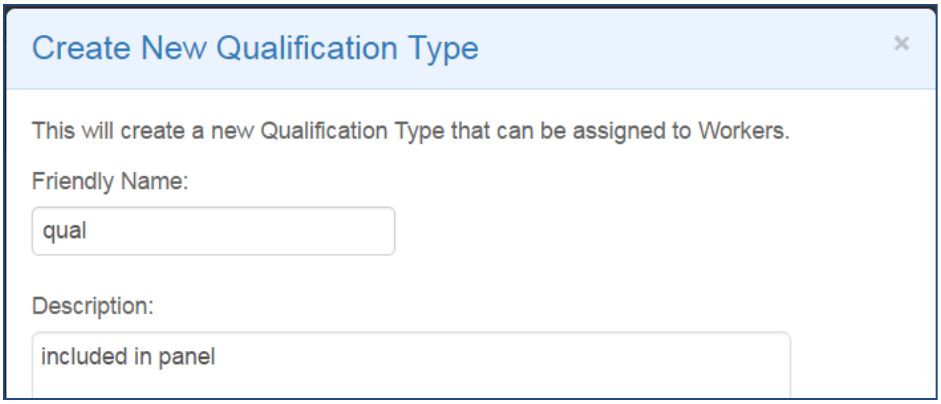
Step 1: Create Qualification Type

Next, to form a panel within MTurk, click on the "Manage" tab and then "Qualification Types" within your MTurk Requester account.

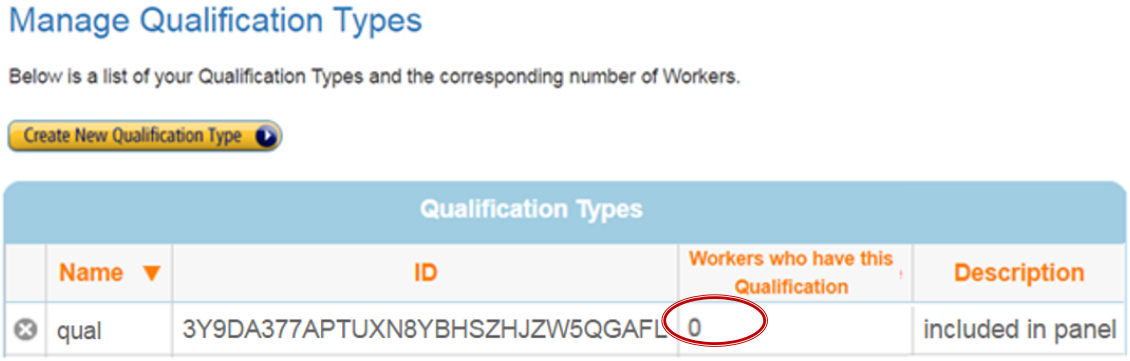
Click on “Create New Qualification Type” button.



For your qualification type, name your panel by entering a label under the “Friendly Name” field. As it is required by MTurk, provide a description. **Important Note: Turkers will be able to view your name and description (which is required) so it is advised that you keep your qualification names and descriptions general, but specific enough for you to remember why you are using these.** We labeled our qualification name “qual” which is short and generic.

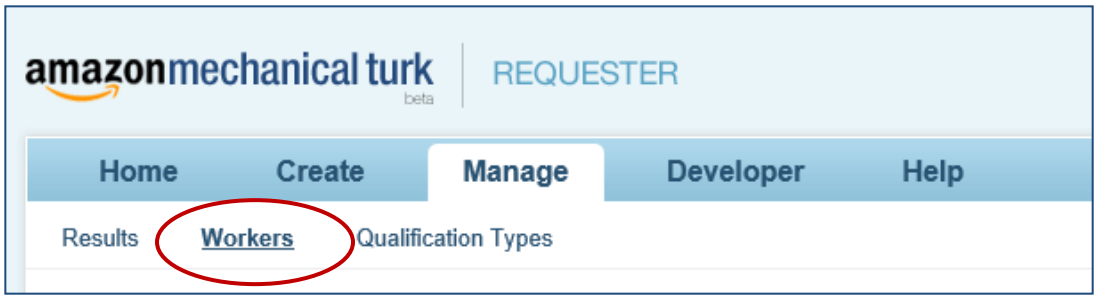


When the new qualification type has been created, we should be able to view it in the “Manage Qualification Types” table within the MTurk interface. It may take a few minutes for the system to update and you will need to refresh the page to view. When your new qualification type has just been created, there will be a “0” in the “Workers who have this Qualification” column as workers have not yet been added to your panel.



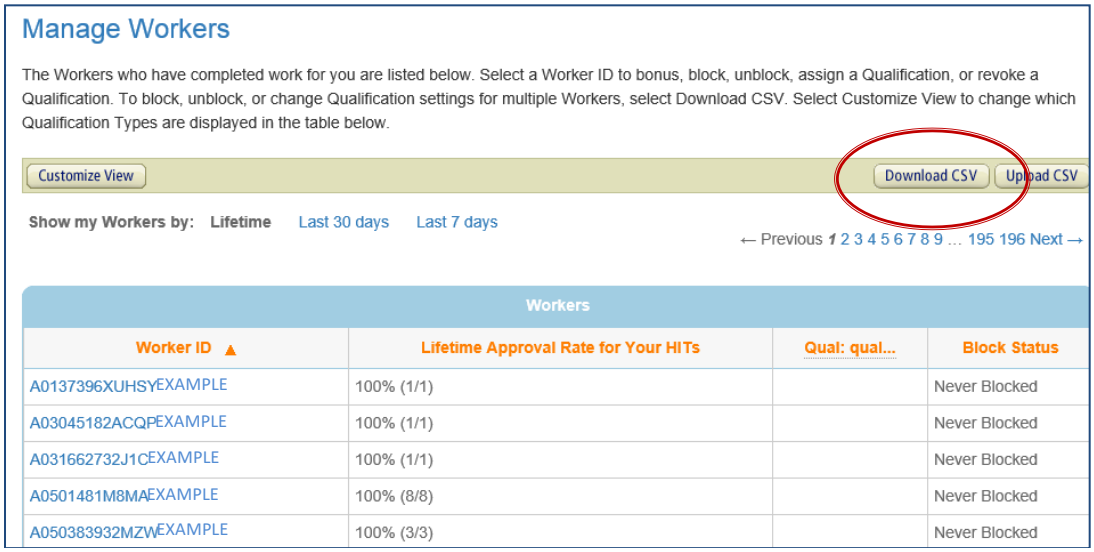
Step 2: Download the "Workers file" and tag each participant (by Worker ID)

To add participants to your panel, download your global MTurk "Workers file." To do so, click on "Workers" under the "Manage" tab.



Here you will find a list of all of the Turkers who have ever completed a HIT for you. For each Turker, you have their WorkerID in the first column, the number of HITs that they have completed in the second column along with the number that you have approved. For example, the fourth Turker on the list below has completed eight of **OUR** studies and we have approved all eight of his or her submissions (as reflected in the lifetime approval rating). This 100% approval rating is just for OUR studies and does not incorporate the approval ratings from other researchers (i.e., "Requesters").

Next, click on the "Download CSV" button to export this table.



This .csv file includes a list of every worker whom has ever completed a study for you. In addition to the lifetime stats (pertaining to your studies) for each individual, you will find two

columns for each qualification type that you have created. The columns are automatically named using the following convention: "CURRENT-Friendly Name" and "UPDATE-Friendly Name" where "Friendly Name," refers to the name that you chose to call your panel. In our example, our "Friendly name" is "qual" so the two columns associated with our panel are "CURRENT-qual" and "UPDATE-qual."

A	C	D	E	L	M
Worker ID	Number of	Number of	Your Lifeti	CURRENT-qual	UPDATE-qual
A1RJ2LOEXAMPLE	1	1	100.00%		
A8DRC9EXAMPLE	1	1	100.00%		
76C9EXAMPLE23	1	1	100.00%		
8UHC9EXAMPLE2	1	1	100.00%		

To add a worker to your panel, assign a numerical code (anywhere from 0 to 100) in the "UPDATE" column. We use the following convention when creating a panel: "1" to anyone in our panel and blank for everyone else.[9] In our example .csv file, we have entered a "1" in the "UPDATE-qual" column for following WorkersIDs: A1RJ2LOEXAMPLE, A8DRC9EXAMPLE and 8UHC9EXAMPLE2. Thus, when this procedure is complete, these three workers will be included in our newly created panel.

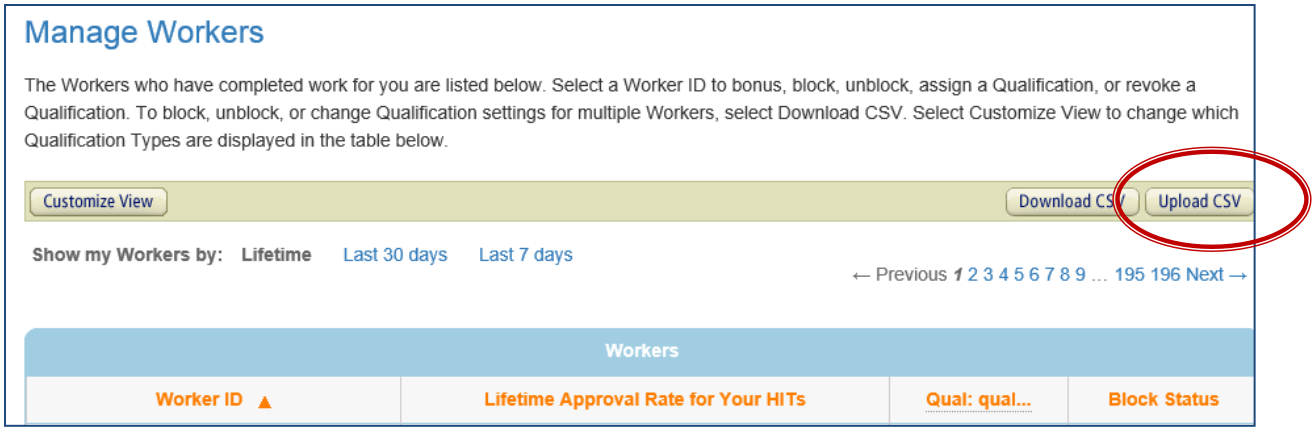
A	C	D	E	L	M
Worker ID	Number of	Number of	Your Lifeti	CURRENT-qual	UPDATE-qual
A1RJ2LOEXAMPLE	1	1	100.00%		1
A8DRC9EXAMPLE	1	1	100.00%		1
76C9EXAMPLE23	1	1	100.00%		
8UHC9EXAMPLE2	1	1	100.00%		1

When you are finished with revising this "Worker file," save as a .csv file to be used in the next step.

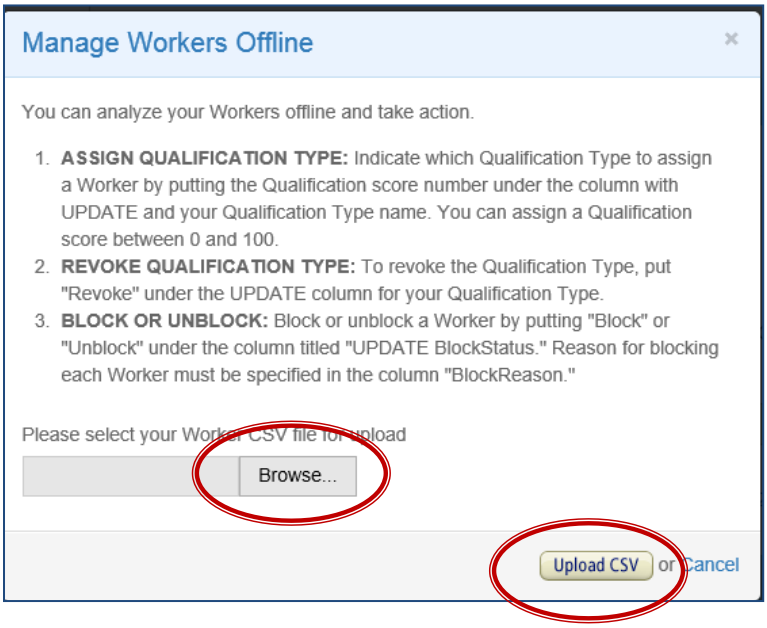
Step 3: Upload the updated "Worker" file

To officially create this panel to be used within MTurk, the revised .csv "Worker File" needs to be uploaded. To do so, click on the "Upload CSV" button (under the "Manage Workers" tab in MTurk).

[9] We leave the space blank for Turkers that we do not have enough information about to discern if they should be in our panel or not. If we know at this point that someone should not be in our panel (e.g., Turkers that have demonstrated inconsistency or deception in the past), we would assign a "0" to the "qual" code of these individuals.



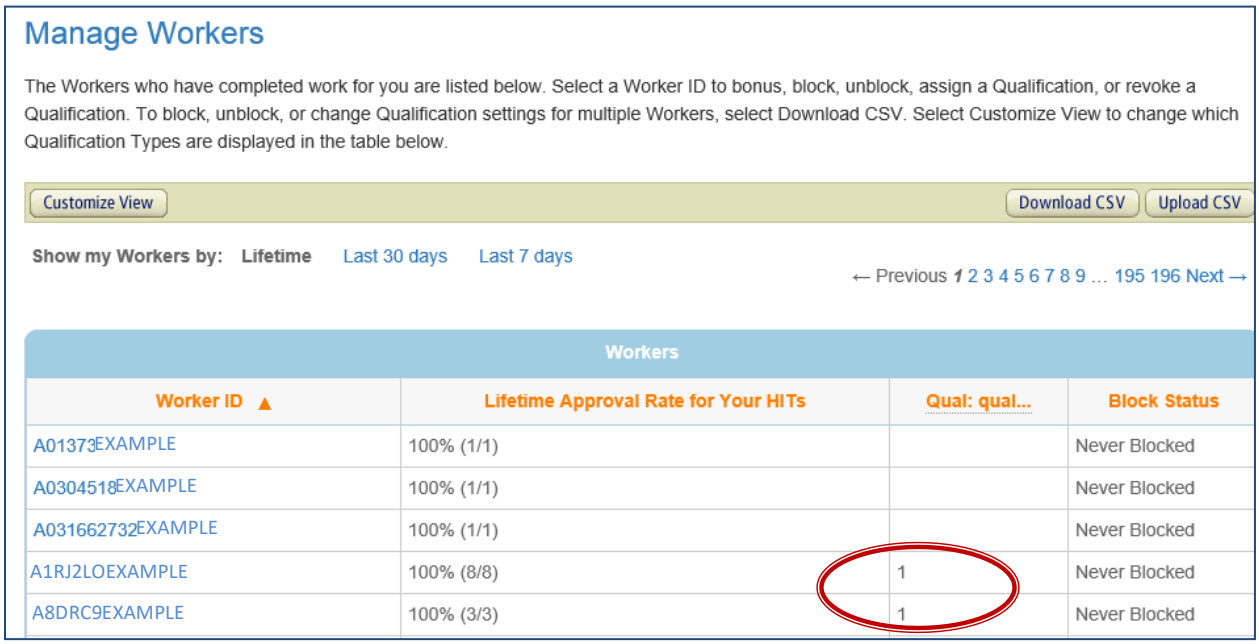
Next, select your .csv file (click "Browse") and "Upload CSV" file. **IMPORTANT: Excels files do NOT work within the MTurk environment. If you have your updates saved in an Excel file, convert to a .csv file before uploading.**



Throughout this process, you may have noticed that you have an option to "Block" specific Turkers from ever taking future studies (in the "Block Status" column). We recommend against using this feature as it is in our experience it leads to emails from Turkers concerned about their MTurk accounts being revoked. Qualification codes are a far more effective way to limit who is allowed to take your studies.

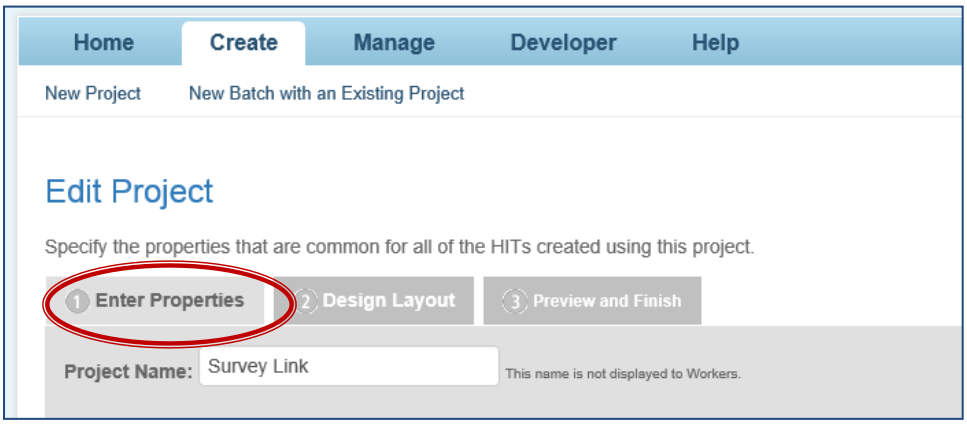
Once you have uploaded your Revised "Worker File" (.csv), you have created your panel. You will see on the screen which workers are included and which ones are not. In our example, there is a qualification named "qual" and some Turkers (each having a unique "Worker ID") have

been assigned the value of "1."

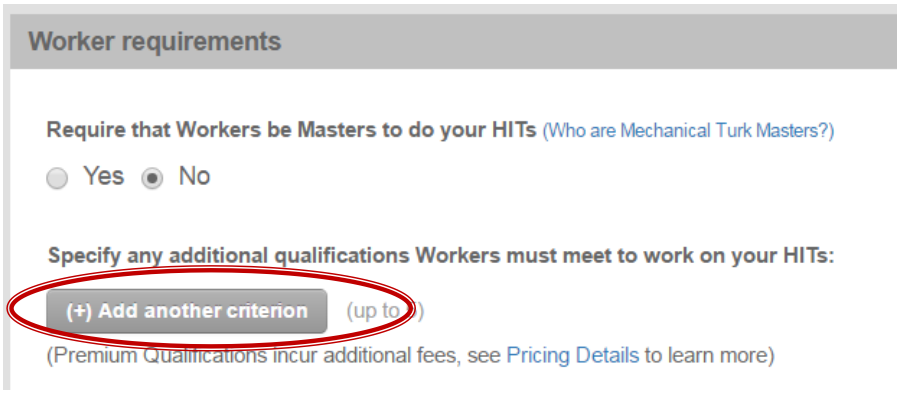


Step 4: Using your panel for future studies

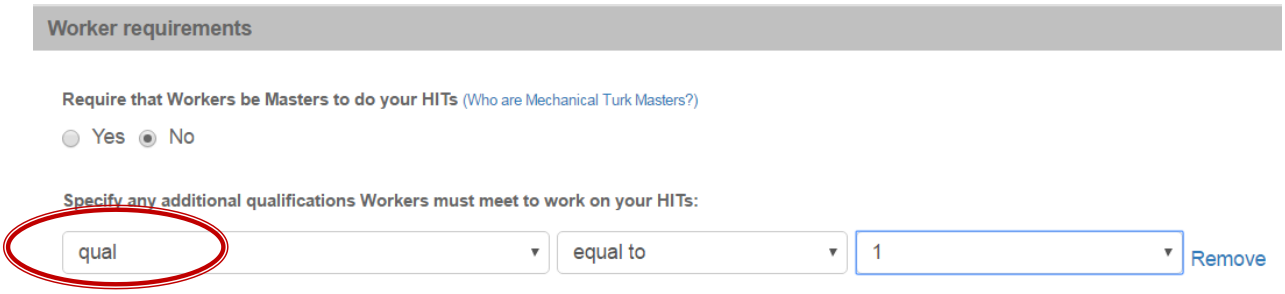
Assume that you only want to make your next study available to your panelist. When creating your HIT, click on the "Enter Properties" tab.



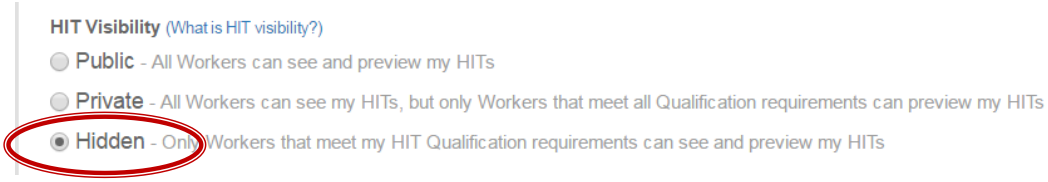
Scroll down to the "Worker requirements" section and click "(+) Add another criterion" button.



Scroll down to the "Qualification Types you have created" section within the drop down and select your panel name (this is the "Friendly Name"). In our example, "qual" is selected and set "equal to" the value of "1" indicating that only panelist are eligible to take our studies.



In the "HIT Visibility" section, make sure that "Hidden" has been checked which indicates that only your panelist can view and take your study. Otherwise, you may receive email requests from non-panelists requesting that they may be added to your panel. If this is undesirable than make sure that "Hidden" is checked.



Then continue to post your new HIT as usual. Note, to improve the response rate, you may want to notify Turkers of the new study that you have posted. Unfortunately, there is no easy way to do this within the MTurk platform. One would need to click on each WorkerID and manually and send a personal email to each Turker who qualifies. The 'R' package 'MTurkR' does allow for batch notifications. See web appendix E for example code for sending out batch notifications.