Replication Report for Study 2 by Galperin, Hahl, Stering, & Guo (2020, Administrative Science Quarterly)

Jiwon Byun (jwbyun@stanford.edu)

November 04, 2021

Contents

Introduction

Employers' selection of job applicants is an important labor market proesses for both employers and individuals. For organizations, access to high-quality workers is a source of competitive advantage. For individuals, access to certain jobs at certain timing can have a large impact on one's career trajectories. Job signaling is the most fundamental and important aspect of selection processes in labor market. Information asymmetries between employers and job applicants provide challenges for both ends.

Most studies have focused on job signaling and applicant capabilities when trying to understand selection processes in labor markets. On the other hand, increasing number of studies suggest that selection decisions are affected not only by perceptions of applicantss' capability but also by perceptions of applicants' commitment to the organization.

While previous literature investigated both the effect of perceptions of applicants' capability and the effect of perceptions of applicants' commitment on the likelihood of a candidate's being selected for a job, the relationship between the two dimensions had been understudied. In an attempt to shed light on such a gap in the literature, Galperin, Hahl, Sterling, and Guo (Gelperin et al. henceforth) conducted a series of online field experiments and published an article in ASQ in the year of 2020. (For reference, see `Links` section in the below.)

Galperin et al. (2020) suggested that signals that influence perceptions of capability in labor markets may have discernable effects of the perceptions of a candidate's commitment, which also affects the likelihood of the candidate's being selected for the job. The paper included four studies, three of which were online field experiments. In this study, I plan to replicate Study 2.

Justification for choice of study

In the original paper, the authors conducted a direct test of the effect of applicants' commitment and high-capability rejection.
Study 2 was conducted to directly manipulated perceived commitment of an applicant to complement one of the other studies where they could not directly manipulate commitment. This is important because the main contribution of the study is suggested (and proved) mediation effect of commitment on likelihood of a job offer.

Anticipated challenges

I anticipate two challenges while attempting to replicate the results.
First, I may run into sample issue. This study is about job signals and hiring managers' decision making in making job offers. Hence, it is important that I only have hiring managers (defined by someone with experiences as a hiring manager) in the sample. Since I have to rely on Qualtrics to do the sampling, less appropriate sample might acquired at the end. Similar issue applies to random assignment of participants.
Second, survey design might be difficult. The main part of this replication study is manipulating commitment of a job applicant. Since commitment could mean different things both conceptually and practically, it is essential that I manipulate the main concepts elaborately. To overcome this challenge, I plan to reach out to original authors and try to acquire survey items that they used for the original study.

Links

- Project repository (on Github): Link to project repository
- Original paper (as hosted in your repo): Link to original paper

##Methods

Description of the steps required to replicate the results (EDITING)

To replicate the results of Study 2, I plan to run the same online experiment on Prolific. Prior to running the main study, I plan to run two pilot studies. The first pilot study will involve non-naive participants, whereas the second pilot study will have naive participants on MTurk.
For the main study, participants will be recruited to fill out a "survey for hiring managers" through Prolific in October-November 2021. I intend to have a sample size of 200 in order to have a similar sample size with the original study, but the sample size may be changed depending on the results of the power analysis. (Power analysis is to be conducted.)
The study will have the same structure as that of the original study: 2 by 2 between-subjects design. Participants will be randomly assigned to one of the four conditions. (2 capability conditions X 2 commitment conditions) Finally given the same stimuli as the original study.
I plan to conduct a manipulation check for both candidate's perceived capability and perceived commitment by combining the questionnaires included in the survey.
With the data acquired from the survey experiment, I plan to conduct two t-tests to replicate the key results of Study 2.

###Power Analysis

Original effect size, power analysis for samples to achieve 80%, 90%, 95% power to detect that effect size. Considerations of feasibility for selecting planned sample size.

###Planned Sample

Planned sample size and/or termination rule, sampling frame, known demographics if any, preselection rules if any.

###Materials

All materials - can quote directly from original article - just put the text in quotations and note that this was followed precisely. Or, quote directly and just point out exceptions to what was described in the original article.

###Procedure

Can quote directly from original article - just put the text in quotations and note that this was followed precisely. Or, quote directly and just point out exceptions to what was described in the original article.

###Analysis Plan

Can also quote directly, though it is less often spelled out effectively for an analysis strategy section. The key is to report an analysis strategy that is as close to the original - data cleaning rules, data exclusion rules, covariates, etc. - as possible.

Clarify key analysis of interest here You can also pre-specify additional analyses you plan to do.

###Differences from Original Study

The most important difference would be that I will be using a different sample. While the original work recruited participants through Qualtrics panel, I will recruit participants through Prolific. While I do not foresee any systematic differences between two platforms, some substantial differences may exist when filtering for the target participants. This may cause differences between the sample of this study and that of original paper.
I acknowledge that any unforeseen issues are the sole responsiblitity of mine.

Methods Addendum (Post Data Collection)

You can comment this section out prior to final report with data collection.

Actual Sample

Sample size, demographics, data exclusions based on rules spelled out in analysis plan

Differences from pre-data collection methods plan

Any differences from what was described as the original plan, or "none".

##Results

Data preparation

Data preparation following the analysis plan.

First, when the study is done, download data from Qualtrics using `qualtRics` package. (Other than `qualtRics` package, load other essential packages for data analysis and visualization, such as: `tidyverse`, `knitr`, `ggplot2`, `stats`, and etc.)
Second, clean the data. Check for missing values and exclude observations with missing values. If needed, conduct data manipulation. Clean and manipulate data so that I have a clean tidy data.
Third, conduct descriptive analyses. Before running the main statistical models, run some descriptive analysis and show the descriptives as needed.
Fourth, conduct main statistical analysis. Present the findings in a table.
Fifth, do some data visualization so that the readers can view the results easily.
Lastly, if needed, run some additional analysis. (Check for homoscedasticity, conduct robustness checks, more explaratory analysis, etc.)

Load Relevant Libraries and Functions

```
library(qualtRics)
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.5     v purrr   0.3.4
## v tibble  3.1.5     v dplyr   1.0.7
## v tidyr   1.1.4     v stringr 1.4.0
## v readr   2.0.2     v forcats 0.5.1
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(knitr)
library(psych)
```

```
##
## Attaching package: 'psych'
```

```
## The following objects are masked from 'package:ggplot2':
##
##     %+%, alpha
```

```
library(haven)
library(readxl)
library(Rmisc)
```

```
## Loading required package: lattice
```

```
## Loading required package: plyr
```

```
## ------------------------------------------------------------------------------
```

```
## You have loaded plyr after dplyr - this is likely to cause problems.
## If you need functions from both plyr and dplyr, please load plyr first, then dplyr:
## library(plyr); library(dplyr)
```

```
## ------------------------------------------------------------------------------
```

```
##
## Attaching package: 'plyr'
```

```
## The following objects are masked from 'package:dplyr':
##
##     arrange, count, desc, failwith, id, mutate, rename, summarise,
##     summarize
```

```
## The following object is masked from 'package:purrr':
##
##     compact
```

```
library(purrr)
library(broom)
library(car)
```

```
## Loading required package: carData
```

```
##
## Attaching package: 'car'

## The following object is masked from 'package:psych':
##
##     logit

## The following object is masked from 'package:dplyr':
##
##     recode

## The following object is masked from 'package:purrr':
##
##     some
```

```
library(psych)
library(rstatix)
```

```
##
## Attaching package: 'rstatix'

## The following objects are masked from 'package:plyr':
##
##     desc, mutate

## The following object is masked from 'package:stats':
##
##     filter
```

Import data

```
# load survey
#qualtricsData_pilotA <- fetch_survey(surveyID = "SV_3CP4lUkXb73NVSm", force_request = T)
```

```
# save data
#write_csv(qualtricsData_pilotA, "/Users/jbyun/Dropbox/2021 Fall/PSYCH 251/galperin2020/data/pilotA.csv
```

```
# load data from csv
pilotA_df <- read_csv("/Users/jbyun/Dropbox/2021 Fall/PSYCH 251/galperin2020/data/pilotA.csv")
```

```
## Rows: 9 Columns: 68

## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr  (33): Status, IPAddress, ResponseId, DistributionChannel, UserLanguage,...
## dbl  (22): Progress, Duration (in seconds), LocationLatitude, LocationLongit...
## lgl  (10): Finished, RecipientLastName, RecipientFirstName, RecipientEmail, ...
## dttm  (3): StartDate, EndDate, RecordedDate

##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

Data exclusion / filtering

```
# clean data (first step)

pilotA_cleaning <- pilotA_df |>
  select(c('Progress', 'Duration (in seconds)', 'Finished', 'companychk', 'candatchk', 'Location', 'int
```

```r
# add id column
pilotA_cleaning <- tibble::rowid_to_column(pilotA_cleaning, "id")

# likelyhood of getting an offer (score)
pilotA_cleaning <- pilotA_cleaning |>
  mutate(offer_score = ifelse(offer == "Very Unlikely", 1,
                              ifelse(offer == "Unlikely", 2,
                                     ifelse(offer == "Somewhat Unlikely", 3,
                                            ifelse(offer == "Undecided", 4,
                                                   ifelse(offer == "Somewhat Likely", 5,
                                                          ifelse(offer == "Likely", 6,
                                                                 ifelse(offer == "Very Likely", 7, NA))))))))

# overqual - high (condition1)

pilotA_cleaning <- pilotA_cleaning |>
  mutate(cond1_high_overqual = ifelse(is.na(Profile_DO_high_overqual_profil), 0, 1))

pilotA_cleaning <- pilotA_cleaning |>
  mutate(cond1_low_overqual = ifelse(is.na(Profile_DO_low_overqual_profile), 0, 1))

# commit - high (condition2)

pilotA_cleaning <- pilotA_cleaning |>
  mutate(cond2_high_commit = ifelse(is.na(CommitmentManipulation_DO_highcommitment_HR), 0, 1))

pilotA_cleaning <- pilotA_cleaning |>
  mutate(cond2_neutral_commit = ifelse(is.na(CommitmentManipulation_DO_neutralcommitment_HR), 0, 1))
```

```r
# clean data (first step)
pilotA_brief <- pilotA_cleaning |>
  select(c('offer_score', 'cond1_high_overqual', 'cond1_low_overqual', 'cond2_high_commit', 'cond2_neut

pilotA_brief <- pilotA_cleaning |>
  select(c('offer_score', 'cond1_high_overqual', 'cond1_low_overqual', 'cond2_high_commit', 'cond2_neut
```

Prepare data for analysis - create columns etc.

```r
#pilotA_brief <- pilotA_brief |>
#  mutate(cond1_high_overqual = factor(cond1_high_overqual, levels = c(0, 1), labels = c("Low", "High")


# only for neutral commitment condition
pilotA_neutral <- pilotA_brief |>
  filter(cond2_high_commit == 0) |>
  select(c("offer_score", "cond1_high_overqual")) |>
  mutate(cond1_high_overqual = factor(cond1_high_overqual, levels = c(0, 1), labels = c("Low", "High")))


# only for high commitment condition
pilotA_high <- pilotA_brief |>
  filter(cond2_high_commit == 1) |>
  select(c("offer_score", "cond1_high_overqual")) |>
  mutate(cond1_high_overqual = factor(cond1_high_overqual, levels = c(0, 1), labels = c("Low", "High")))
```

Descriptive statistics

Pilot A

```
library(psych)
describe(pilotA_brief)
```

```
##                       vars n mean   sd median trimmed  mad min max range  skew
## offer_score              1 9 5.22 1.09      5    5.22 1.48   4   7     3  0.13
## cond1_high_overqual      2 9 0.44 0.53      0    0.44 0.00   0   1     1  0.19
## cond1_low_overqual       3 9 0.56 0.53      1    0.56 0.00   0   1     1 -0.19
## cond2_high_commit        4 9 0.56 0.53      1    0.56 0.00   0   1     1 -0.19
## cond2_neutral_commit     5 9 0.44 0.53      0    0.44 0.00   0   1     1  0.19
##                       kurtosis   se
## offer_score              -1.61 0.36
## cond1_high_overqual      -2.17 0.18
## cond1_low_overqual       -2.17 0.18
## cond2_high_commit        -2.17 0.18
## cond2_neutral_commit     -2.17 0.18
```

```
describe(pilotA_neutral)
```

```
##                       vars n mean   sd median trimmed  mad min max range skew
## offer_score              1 4 5.00 1.15      5    5.00 1.48   4   6     2 0.00
## cond1_high_overqual*     2 4 1.25 0.50      1    1.25 0.00   1   2     1 0.75
##                       kurtosis   se
## offer_score              -2.44 0.58
## cond1_high_overqual*     -1.69 0.25
```

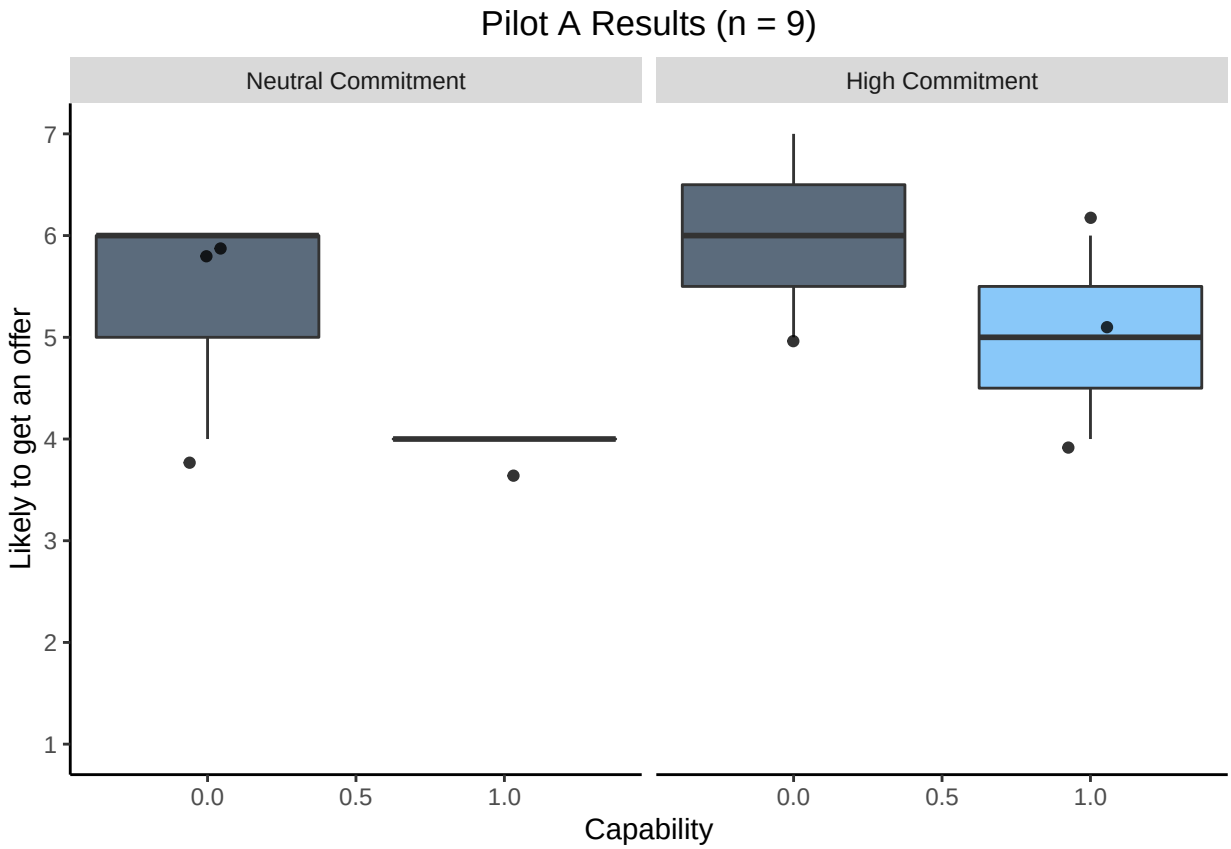
```
describe(pilotA_high)
```

```
##                       vars n mean   sd median trimmed  mad min max range  skew
## offer_score              1 5  5.4 1.14      5     5.4 1.48   4   7     3  0.19
## cond1_high_overqual*     2 5  1.6 0.55      2     1.6 0.00   1   2     1 -0.29
##                       kurtosis   se
## offer_score              -1.75 0.51
## cond1_high_overqual*     -2.25 0.24
```

```
commit_labels <- c("Neutral Commitment", "High Commitment")
names(commit_labels) <- c("0", "1")

ggplot(data = pilotA_brief, aes(x = cond1_high_overqual, y = offer_score, group = cond1_high_overqual, f
  geom_boxplot(alpha = 0.7) +
  geom_jitter(width = 0.08, alpha = .8) +
  guides(fill = "none") +
  scale_y_continuous(breaks = 1:7, limits = c(1, 7)) +
  theme(legend.position = c(0.9, 0.15),
        legend.direction = "vertical",
        legend.background = element_rect(fill = "transparent"),
        legend.title = element_blank(),
        axis.line = element_line(),
        panel.grid = element_blank(),
        panel.background = element_blank(),
        plot.title = element_text(hjust = 0.5)) +
  facet_wrap(~cond2_high_commit, labeller = labeller(cond2_high_commit = commit_labels)) +
  ggtitle("Pilot A Results (n = 9)") +
  labs(x = "Capability", y = "Likely to get an offer")
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```




```
ggsave("/Users/jbyun/Dropbox/2021 Fall/PSYCH 251/galperin2020/data/pilotA_boxplot.png")
```

```
## Saving 6.5 x 4.5 in image
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```

Confirmatory analysis

The analyses as specified in the analysis plan.

Side-by-side graph with original graph is ideal here

The main statistical model is going to be two t-tests, the same as that from original study. One t-test is to be conducted for Capability and the other t-test is to be conducted for Commitment.

Pilot A

Below are the key analysis results from Pilot A.

```
#neutral_t <- t.test(offer_score ~ cond1_high_overqual, data = pilotA_neutral)
#neutral_t

# could not run the model because I do not have enough observations.
```

For the first t-test, I could not run the model because I did not have enough observations. This is due to small sample size and randomization. I expect this problem to be resolved itself when I get enough sample size for the study.

```r
high_t <- t.test(offer_score ~ cond1_high_overqual, data = pilotA_high, paired = FALSE)
high_t
```

```
##
##  Welch Two Sample t-test
##
## data:  offer_score by cond1_high_overqual
## t = 0.86603, df = 1.6842, p-value = 0.4921
## alternative hypothesis: true difference in means between group Low and group High is not equal to 0
## 95 percent confidence interval:
##  -4.976997  6.976997
## sample estimates:
##  mean in group Low mean in group High
##                  6                 5
```

The above shows the results for the second t-test. (For high commitment group.)

```
(This part comes from a previous draft. To be deleted)
The main statistical model is going to be a two-way ANOVA analysis. Two-way ANOVA is the best statitical
Since the original paper ran two t-tests, I also plan to conduct the two t-tests as a supplement.
```

###Exploratory analyses

Any follow-up analyses desired (not required).

Discussion

Summary of Replication Attempt

Open the discussion section with a paragraph summarizing the primary result from the confirmatory analysis and the assessment of whether it replicated, partially replicated, or failed to replicate the original result.

Commentary

Add open-ended commentary (if any) reflecting (a) insights from follow-up exploratory analysis, (b) assessment of the meaning of the replication (or not) - e.g., for a failure to replicate, are the differences between original and present study ones that definitely, plausibly, or are unlikely to have been moderators of the result, and (c) discussion of any objections or challenges raised by the current and original authors about the replication attempt. None of these need to be long.