UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

Dependent Choices in Employee Selection: Modeling Choice Compensation andConsistency

Permalink

https://escholarship.org/uc/item/5qp3g74b

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 39(0)

Authors

Krefeld-Schwalb, Antonia
Scheibehenne, Benjamin
Rieskamp, J¨org
et al.

Publication Date

2017

Peer reviewed

eScholarship.org Powered by the California Digital Library
University of California

Dependent Choices in Employee Selection: Modeling Choice Compensation and Consistency

Antonia Krefeld-Schwalb (antonia.krefeld-schwalb@unige.ch)
Benjamin Scheibehenne (Benjamin.scheibehenne@unige.ch)
University of Geneva, Geneva School of Economics and Management, Uni Mail, Bd du Pont-d'Arve 40,
CH- 1112 Geneva 4, Switzerland

Jörg Rieskamp (joerg.rieskamp@unibas.ch) & Nicolas Berkowitsch (nicolas.berkowitsch@unibas.ch)
University of Basel, Department of Psychology,
4055 Basel, Switzerland

Abstract

Past choices can influence subsequent choices in employee selection. Previous approaches rather described similar sequential effects with feedback learning or the misperception of randomness. However, in the selection of job candidates also the accumulation of the moral impact of previous choices might influence subsequent choices. We investigated that question by making two major contributions to the literature. First, we developed an experimental paradigm for measuring sequential choices in employee selection and second, we implemented a widely applicable computational model, the Dependent Sequential Sampling Model, for explaining sequential effects in choices. By using this methodological approach, we uncovered sequential effects in employee selection. Participants (N=600) were especially motivated to compensate for morally dubious choices, with some participants showing consistent choice behavior if their previous choices had been morally virtuous. These results support the assumption of asymmetric compensation of morally dubious choices, sometimes referred to as the moral cleansing hypothesis.

Keywords: sequential sampling model; preferential choice; sequential decision making; employee selection.

Theoretical Background

Ethical and moral aspect play a major role, when managers select new employees. In order to enable a fair employee selection procedure, every candidate is supposed to be evaluated only on her skills and accomplishments relevant for the position in question. This does not only involve the prohibition of any kind of discrimination, but also demands the evaluation of every candidate, independent of other candidates and contextual factors. However, interviewers deviate from such a fair evaluation procedure. Discrimination in the application process for jobs, e.g. based on gender and skin color, is common (Gregory, 2003; Bertrand & Mullainathan, 2004; Pager, Western, & Bonikowski, 2009). And instead of evaluating candidates independently, previous candidates on the same day influence the evaluation of later candidates (Simonsohn & Gino, 2013). The present article tackles this problem. We will present a theory driven experimental method and computational model for investigating sequential effects in the employee selection and other areas. Our approach aims at first identifying sequential effects and second quantifying the individual degree and direction of the effects.

Sequential Effects in Employee Selection

Many sequential effects in decision making and choices are explained with the "gamblers fallacy", the misperception of randomness (Ayton & Fischer, 2004; Clotfelter & Cook, 1993). However, if moral aspects are relevant for the choice, other factors contribute to the sequential effects as well. It is often assumed that the moral credentials of previous choices are accumulated and influence subsequent choices (e.g. Monin & Miller, 2001; Tetlock, Kristel, Elson, Green, & Lerner, 2000). This can well be illustrated in the employee selection. Given the common problem of discrimination in the job market (Gregory, 2003; Bertrand & Mullainathan, 2004; Pager et al., 2009), it is of higher moral value to choose a person belonging to a group discriminated against than a person belonging to a favored group. This can lead to various potential sequential choice effects. If individuals made a series of choices for the same group, e.g the group not discriminated against, they tend to compensate these choices in the following (Conway & Peetz, 2012; Jordan, Mullen, & Murnighan, 2011; Sachdeva, Iliev, & Medin, 2009). While some individuals simply balance morally dubious and morally good choices (Dhar, Huber, & Khan, 2007; Dhar & Simonson, 1999; Huber, Goldsmith, & Mogilner, 2008), less symmetric compensating choice behavior is also possible. For example, especially after morally dubious choices, people feel the urge to compensate for these choices with a morally virtuous choice subsequently, referred to as *cleansing* (Tetlock et al., 2000). And also the complementary effect has been observed, referred to as *licensing* (e.g. Monin & Miller, 2001). Nonetheless, even contrarily to the idea of compensation, consistent choice behavior is also possible (Gneezy, Imas, Nelson, Brown, & Norton, 2011; Zhang, Cornwell, & Higgins, 2014).

Modeling Sequential Choice Effects

In most domains of real life choices and decisions, sequential effects have either been explained with models involving reinforcement learning (e.g. Kruschke, 1992; Gluck et al., 1988; Rieskamp & Otto, 2006; Simão & Todd, 2002; Stewart, Brown, & Chater, 2002; Stewart & Brown, 2004; Todd, 2007) or the effects are explained with the "gamblers fallacy" (Thaler & Johnson, 1990; Novemsky & Dhar, 2005; Chen,

Moskowitz, & Shue, 2016; Ayton & Fischer, 2004; Clotfelter & Cook, 1993). However, these models do not explain asymmetries in compensating previous choices, which are in the moral literature sometimes referred to as moral *licensing* or moral *cleansing*, that even occur without explicit feedback. We will introduce a computational model in the following that can account for these effects.The model involves one parameter that indicates the individual degree and direction of sequential effects, it quantifies the tendency for compensation or consistency with previous choices.

Method

In order to investigate sequential effects in the employee selection, we developed and applied the experimental paradigm "The Sequential Employee Selection Task". In previous experiments on sequential effects in the job application process and other domains, the investigated choice often followed a different task, e.g. a rating task. Contrarily, participants in our experiment were faced with repeated choice tasks of the same format and in the same context.

After a series of choices between two candidates, who clearly differed in the qualification for the job (*dominated trials*), subjects were to choose between two equally qualified candidates (*ambiguous trials*). In some of the conditions candidates from a group discriminated against (discriminated group) dominated the previous trials, and in other conditions candidates from the complementary favored group (non-discriminated group) dominated these trials. The following ambiguous trials were the same between the conditions. Thus, different choice probabilities in these ambiguous trials indicated the influence of the previous trials.

If the choice probabilities in the ambiguous trials systematically differ between the conditions, there exist sequential effects in this task (H_1). If the probability to choose a candidate from the same, previously dominating, group is decreased, compensating choices are observed (H_2). If the probability increases, participants make consistent choices (H_3). If the compensation differs with regard to whether the discriminated or the non-discriminated group dominated the first trials, the compensation is asymmetric and the moral impact of the choices is accumulated. This finding would indicate sequential effects referred to as moral licensing (H_{2a}) or moral cleansing (H_{2b}). If previous choices are compensated symmetrically, choices are balanced (H_{2c}). In order to estimate initial choice biases and the weights of the candidates' attributes, the manipulated sequences can further be compared to control conditions, in which only the ambiguous trials, the same as in the experimental conditions, were tested. As an additional add-on to previous studies, the sequential effects were not only tested in one single trial, but four ambiguous trials, enabling estimation of the individual degree of compensation.

Participants

We recruited participants living in the U.S. through amazon's Mechanical Turk (Amazon, 2013). In order to avoid inattentive participants or computer programs filling out the questions, we included an additional test page at the beginning. Of the 635 recruited participants 600 (95%) passed that screening (47% f, mean age= 36.06). Those participants received USD 1.50 for their participation in the 10 minutes experiment.

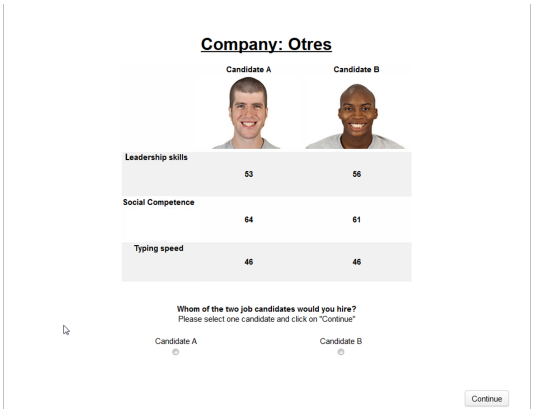

Figure 1: Screenshot of one of the ambiguous trials in a condition with skin color as the salient category

Design and Procedure

The Sequential Employee Selection Task was manipulated on 2 factors between the subjects, resuming in 6 between-subject conditions. The sequential effects were investigated in four of these conditions differing with regard to the salient category, skin color vs. gender, and with regard to whether the candidates from the discriminated (female or black candidates) or the non-discriminated group (male or white candidates) dominated the first eight trials. In the two control conditions the baseline choice probabilities for candidates belonging to the respective groups were tested.

Participants were presented with a hypothetical recruiting scenario and asked to repeatedly choose the most suitable candidate out of two job applicants, see Figure 1 for an example. All candidates were described by three attributes on scales between 0-100: "leadership skills", "social competence", and "typing speed". The information was presented in an information board and a profile picture above this board. On top of it, a fictitious company name served as a title of the trial. The first two of the attributes were described as important in the initial instructions, whereas the third was described as a less important attribute for the position. The candidates' individual levels on the attributes are indicated by the numbers in the respective cells of the information board. The profile pictures above the table indicated the gender or the skin color of the candidates, depending on the condition. Pictures from the Chicago Face Database (Ma, Correll, & Wittenbrink, 2015), only smiling faces, were used for the present experiment. Participants received no instructions with regard to the relevance of these personal characteristics and other features for the position, beyond the instructions on the three

Table 1: Illustration of the series of trials in the gender conditions. In the skin color conditions female faces are replaced with black male faces.

Dominating group	Dominated trials				Ambiguous trials			
	1	2	...	8	9	10	11	12
Discr	♀> ♂				♀= ♂			
Non-discr	♀< ♂				♀= ♂			
Control	-				♀= ♂			

Note. Discr/Non-discr = female or black/male or white candidates dominate first 8 trials; Control = only ambiguous trials; $[>,<,=]$ = better, worse, equally qualified.

attributes.

Each participant made twelve pairwise decisions in a row. The description of the task emphasized that the twelve candidate pairs applied for twelve different companies. Furthermore, showing fictitious company names at every decision stressed that each choice ought to be independent of the previous ones. The procedure of the experiment in the gender conditions is illustrated in Table 1. The choice pairs were constructed such that one of the two candidates was clearly superior on the two most important attributes (i.e. leadership skills and social competence) in the first eight pairs (= dominated trials), the two relevant attributes provided higher values for one candidate. Contrarily, the candidates in the last four pairs were equally well suited for the job (= ambiguous trials). In those trials, one of the relevant attributes had a higher value for one candidate, whereas the other attribute provided a higher value for the other candidate. The values of the third attribute were equal between the two. Thus, even when participants weighted all information for making a choice between the candidates, this weighted additive would lead to no preference for one candidate or the other. It was further controlled, that in two of these ambiguous trials the candidates from one group and in the remaining two trials the candidates from other group had a higher value on the first attribute. This procedure allows to control for the common use of a heuristic which places more weight on the first discriminating attribute (Take-the-best heuristic (TTB) Gigerenzer & Goldstein, 1996). The order of the trials, within the dominated and the remaining ambiguous trials was randomized, and the position of the dominated candidates (left or right) was counterbalanced. However, the first of the ambiguous trials was fixed so that the the candidate from the discriminated group had a higher value on the first attribute in this trial. This was done in order to increase the contrast between the conditions. Subjects were randomly assigned to one of the conditions.

Formalization of the Dependent Sequential Sampling Model

In order to explain sequential effects in choices it is assumed that some information of previous choices must be accumulated in memory and influence subsequent choices. As for modeling the evidence accumulation models within one trial (e.g. Busemeyer & Townsend, 1993; Lee, 2004; Newell & Lee, 2011), sequential sampling models might be used for modeling this accumulation process across trials as well.

In their simplest form, sequential sampling models assume that evidence in a given binary choice task is accumulated from a starting point across a fixed number of steps. After all fixed steps were made, this option with the highest accumulated evidence is chosen. For the purpose at hand, we adapted a similar sequential sampling model (Milosavljevic, Malmaud, & Huth, 2010), for incorporating previous choices. The starting point of the evidence accumulation process usually represents only any previous bias for one of the options. In the present study, it was enlarged with incorporating previous choices as well. It was further considered 1) that the influence of previous choices decays exponentially with temporal distance and 2) that previous choices could potentially lead to compensation, confirmation or not influence subsequent choices. The latter, the direction and strength of the influence of previous choices, was governed by the compensation-consistency parameter κ.

Relying on a simple drift diffusion model (Milosavljevic et al., 2010) we assume that the evidence z in a binary decision task evolves according to the following equation across all time steps s:

$$z_s = z_{(s-1)} + \mu + \varepsilon_s \tag{1}$$

The evidence which is added at every time step is defined by the speed of evidence accumulation μ, representing the overall difference of the options' values in the trial $\mu = V_A - V_B$, and an error term $\varepsilon_s \sim N(0,.1)$. The values of the options V represent the sum of the option's attributes weighted with the attributes' weights w. If there is no previous bias nor any influence of previous choices, this evidence accumulation starts at 0. For additionally indicating a systematic bias in a choice task β is introduced. The parameter describes any initial response bias at the starting point z_0. In a similar vein z_0 can incorporate the influence of previous choices. We assume that the starting point in a given trial t, z_{0t} is further influenced by $\rho = [-1,1]$ and a compensating-consistency parameter κ. The function ρ incorporates the evidence for previous choices and the memory for it. It is determined as the inner product of a decay vector and the previous evidence. The decay vector determines that more recent trials have a greater impact. In line with previous research on memory, the memory further decreases as an exponential function. The impact of previous trials increases in those trials, in which the evidence was sparse.

$$\rho_t = \frac{1}{(V_{At} - V_{Bt})} \cdot e^{-decay_t} \tag{2}$$

As has been outlined in the introduction different hypotheses on the direction of the effect in sequential choices have been formulated. We incorporated these hypothesis in the compensation-consistency parameter $\kappa = [-1,1]$[1] which is multiplied with ρ for determining the direction of the sequential effect. If $\kappa > 0$, previous choices are compensated, if $\kappa < 0$, individuals make consistent choices and if $\kappa = 0$, previous choices do not influence the present choice. Following the starting point z_0 in trial t is defined as:

$$z_{0t} = \beta - \kappa \times \rho_t \tag{3}$$

Finally, a probit link is applied for predicting the choice probability in any trial t based on the accumulated evidence from the starting point z_{0t} up to z_{St} in that trial.

$$P(A)_t = \phi(z_{S_t}, 0, 1) \tag{4}$$

Additionally we introduced a trembled hand error ξ which indicates the probability to guess between the options.

$$P(A)_t = (1-\xi) \times \phi(z_{S_t}, 0, 1) + \xi \times .5 \tag{5}$$

Results

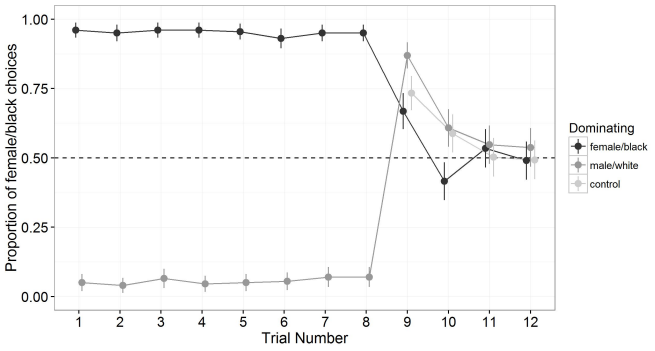

Figure 2: Probability to choose the minority candidate, as a function of the dominating group, and the position in the trial sequence (Trial Number). The choice probabilities of the dominated trials are averaged over the trials. The error bar represent $+/-1.96 \times SE$. The dashed line indicates guessing probability .5.

The dominating candidate was chosen on average in 94 % of the dominated trials, indicating that the participants followed the instructions of the task very well. Figure 2 illustrate the choice probabilities of the candidates from the discriminated group. The data were collapsed over the categories skin color and gender, for reducing redundancy. As expected, we observed sequential effects in the task, because the probability to choose a female or black candidate in the ambiguous trials, (Trial Number 9-10), differed between the conditions. The probability was decreased, compared to the other conditions, if the respective discriminated group had dominated the previous trials. The choice probabilities in the control condition serve as a reference for choice probabilities without sequential effects.

For explaining the observed sequential effects, the DSSM model was fitted to the data. The choice probabilities in the control conditions were used to inform the parameters of the DSSM model. The response bias parameter β was fixed so that $\Phi(\beta, 0, 1)$ corresponds to the averaged probability to choose a candidate from the discriminated group in the control conditions (P(female/black) = .58). Likewise the decision weights were adapted for capturing the higher weight on the first attribute, by adapting the attributes weights w to the ratio of the choice probabilities, in accordance with the first attribute P(female/black) = .78, or not P(female/black) = .38, w = (2,1,0). The final model was fitted to the complete data set of the experimental conditions via grid search and minimizing logloss ($logLoss = -\frac{1}{n}\Sigma log(Likelihood)$).

The best fitting parameters for the experimental conditions and the corresponding logLoss are illustrated in Table 2. The logLoss for a complete guessing model would be logLoss = .69. In order to further validate the model we compared it via BIC to a complete Guessing and a Sequential Sampling Model SSM without dependencies between the trials. Across all participants, the DSSM provided a better fit than the guessing model and the SSM, BIC_{DSSM} = 1990, BIC_{SSM} = 3423, and BIC_{guess} = 6670. The best fitting parameters indicate

Table 2: Best fitting parameters of κ as a function of the conditions.

Cat	Gender		Skin Color	
Dom. group	discr	non-discr	discr	non-discr
κ	.08	.48	.12	.56
logLoss	.25	.31	.29	.29

Note. logLoss = mean negative log Likelihood

compensating choices in all conditions, however the compensation is higher in the conditions in which the candidates from the non-discriminating group dominated the first eight trials. In order to test the difference of κ between the conditions, the best fitting parameters for κ were additionally estimated on the individual level. This comparison revealed significant differences between the conditions in the gender condition $T(193.32) = -7.73, p < .001, log(BF)^2 > 10$ and the skin color condition $T(164.09) = -8.99, p < .001, log(BF) > 10$. This indicates stronger compensation of morally dubious choices, than compensation of morally virtuous choices. There were large individual differences in the parameters, κ $SD_{discr} = .69$ and $SD_{nondiscr} = .50$, and a considerable number of participants $\sim$ 30% applied extremely consistent choice

[1]The compensation-consistency parameter is scaled so that the the maximum compensation is twice the number of steps in the accumulation process, because due to the scaling of ρ to [-1,1] the maximum evidence is S and the minimum evidence is -S. Thus, the maximum compensation can not be bigger than twice the number of accumulation steps

[2]The Bayes factors were calculated with ttestBF function of the R-package "BayesFactor"

behavior in the condition in which candidates from the discriminated group dominated the first 8 trials.

To conclude, we observed sequential effects in the sequential employee selection task. In general, participants tended to compensate for previous choices, especially if these choices were morally dubious. If the previous choices were of high moral value, choosing the candidates from the group discriminated against, a large number of participants showed consistent choice behavior.

Discussion

Present choices between job candidates are influenced by previous, unrelated, choices. Choosing a job candidate consistently from one group over the complementary group, defined by skin color or gender, decreased the probability to choose a candidate from the same group in subsequent trials. However, the sequential effects are not symmetric, because not all choices are equally compensated for. Thus, instead of balancing groups over a series of choices our data support the assumption of a stronger compensation for morally dubious choices, sometimes referred to as the moral cleansing hypothesis (Tetlock et al., 2000).

The mere existence of moral cleansing and moral licensing effects has been questioned recently via series of failed replications (Earp, Everett, Madva, & Hamlin, 2014; Blanken, Van De Ven, Zeelenberg, & Meijers, 2014). However, the experimental studies investigating these effects rarely observed multiple similar choices in a row. Those studies rather used different tasks, investigated behavioral intentions or used other experimental methods aiming at inducing a specific mindsets, in order to influence subsequent single choices. Furthermore, no computational model has been implemented for analyzing the data. We make two major contribution to this debate. First, we present an experimental paradigm for observing sequential effects in the employee selection and beyond. The task can easily be framed differently in order to test sequential effects in other contexts as well. Second, we formalized a computational model, the Dependent Sequential Sampling Model, for describing and explaining sequential choice effects and corresponding individual differences. Especially the individual estimates of κ via the DSSM indicate large individual differences with regard to the compensation or confirmation of previous choices. While κ on the group level indicated compensation also in the conditions which were dominated by candidates from the non-discriminating group, investigating individual estimates identified large individuals differences. Importantly, a meaningful number of participants showed actual consistent choice behavior (Zhang et al., 2014; Gneezy et al., 2011).

The DSSM relates to the well established application of accumulator models in choice tasks (Busemeyer & Townsend, 1993; Lee, 2004; Newell & Lee, 2011; Ratcliff, 1978). For the purpose at hand the model was used in a very simple version (Milosavljevic et al., 2010). A richer dataset, with within-subject manipulation of conditions and a larger number of sequential choices would further allow to increase the complexity of the model by estimating more parameters on the individual level, for example the individual initial decision bias. Nonetheless, the current simplicity is perfectly suited for the present research questions.

We provide strong evidence for compensation of morally choices in employee selection and the presented experimental and methodological approach further allows replicating our findings in other areas as well.

References

Ayton, P., & Fischer, I. (2004). The hot hand fallacy and the gambler's fallacy: two faces of subjective randomness? *Memory {&} Cognition*, *32*(8), 1369–1378. Doi: 10.3758/BF03206327

Bertrand, M., & Mullainathan, S. (2004). Are Emily and Greg More Employable Than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination. *American Economic Review*, *94*(4), 991–1013. Doi: 10.1257/0002828042002561

Blanken, I., Van De Ven, N., Zeelenberg, M., & Meijers, M. H. C. (2014). Three attempts to replicate the moral licensing effect. *Social Psychology*, *45*(3), 232–238. Doi: 10.1027/1864-9335/a000189

Busemeyer, J. R., & Townsend, J. T. (1993). Decision field theory: a dynamic-cognitive approach to decision making in an uncertain environment. *Psychological Review*, *100*(3), 432–459.

Chen, D., Moskowitz, T., & Shue, K. (2016, feb). *Decision-Making under the Gambler's Fallacy: Evidence from Asylum Judges, Loan Officers, and Baseball Umpires* (Tech. Rep.). Cambridge, MA: National Bureau of Economic Research. Doi: 10.3386/w22026

Clotfelter, C. T., & Cook, P. J. (1993). Notes: The "Gambler's Fallacy" in Lottery Play. *Management Science*, *39*(12), 1521–1525. Doi: 10.1287/mnsc.39.12.1521

Conway, P., & Peetz, J. (2012, jul). When Does Feeling Moral Actually Make You a Better Person? Conceptual Abstraction Moderates Whether Past Moral Deeds Motivate Consistency or Compensatory Behavior. *Personality and Social Psychology Bulletin*, *38*(7), 907–919. Doi: 10.1177/0146167212442394

Dhar, R., Huber, J., & Khan, U. (2007). The shopping momentum effect. *Journal of Marketing Research*, *44*(203), 1–36.

Dhar, R., & Simonson, I. (1999, feb). Making Complementary Choices in Consumption Episodes: Highlighting versus Balancing. *Journal of Marketing Research*, *36*(1), 29. Doi: 10.2307/3151913

Earp, B. D., Everett, J. A. C., Madva, E. N., & Hamlin, J. K. (2014). Out, Damned Spot: Can the "Macbeth Effect" Be Replicated? *Basic and Applied Social Psychology*, *36*(1), 91–98. Doi: 10.1080/01973533.2013.856792

Gigerenzer, G., & Goldstein, D. G. (1996). Reasoning the fast and frugal way: models of bounded ratio-

nality. *Psychological Review*, *103*(4), 650–69. Doi: 10.1037/0033-295X.103.4.650

Gluck, M. a., Bower, G. H., Donegan, N., Estes, W. K., Kahneman, D., Mcclelland, J., ... Schechter, N. (1988). From conditioning to category learning: an adaptive network model. *Journal of experimental psychology. General*, *117*(3), 227–47. Doi: 10.1037/0096-3445.117.3.227

Gneezy, A., Imas, A., Nelson, L., Brown, A., & Norton, M. (2011). Paying to Be Nice: Consistency and Costly Prosocial Behavior. *Advances in Consumer Research*, *39*, 468–470.

Gregory, R. F. (2003). *Women and Workplace Discrimination: Overcoming Barriers to Gender Equality*. Rutgers University Press.

Huber, J., Goldsmith, K., & Mogilner, C. (2008, dec). Reinforcement versus balance response in sequential choice. *Marketing Letters*, *19*(3-4), 229–239. Doi: 10.1007/s11002-008-9042-5

Jordan, J., Mullen, E., & Murnighan, J. K. (2011). Striving for the Moral Self: The Effects of Recalling Past Moral Actions on Future Moral Behavior. *Personality and Social Psychology Bulletin*, *37*(5), 701–713. Doi: 10.1177/0146167211400208

Kruschke, J. K. (1992). *ALCOVE: an exemplar-based connectionist model of category learning.* (Vol. 99) (No. 1). Doi: 10.1037/0033-295X.99.1.22

Lee, K. (2004, dec). Age, neuropsychological, and social cognitive measures as predictors of individual differences in susceptibility to the misinformation effect. *Applied Cognitive Psychology*, *18*(8), 997–1019. Doi: 10.1002/acp.1075

Ma, D. S., Correll, J., & Wittenbrink, B. (2015). The Chicago face database: A free stimulus set of faces and norming data. *Behavior research methods*, *47*, 1122–1135. Doi: 10.3758/s13428-014-0532-5

Milosavljevic, M., Malmaud, J., & Huth, A. (2010). The Drift Diffusion Model can account for the accuracy and reaction time of value-based choices under high and low time pressure. *Judgement and Decision Making*, *5*(6), 437–449. Doi: 10.2139/ssrn.1901533

Monin, B., & Miller, D. T. (2001). Moral credentials and the expression of prejudice. *Journal of Personality and Social Psychology*, *81*(1), 33–43. Doi: 10.1037/0022-3514.81.1.33

Newell, B. R., & Lee, M. D. (2011, dec). The right tool for the job? Comparing an evidence accumulation and a naive strategy selection model of decision making. *Journal of Behavioral Decision Making*, *24*(5), 456–481. Doi: 10.1002/bdm.703

Novemsky, N., & Dhar, R. (2005, dec). Goal Fulfillment and Goal Targets in Sequential Choice. *Journal of Consumer Research*, *32*(3), 396–404. Doi: 10.1086/497551

Pager, D., Western, B., & Bonikowski, B. (2009). Discrimination in a Low-Wage Labor Market: A Field Experiment. *American Sociological Review*, *74*(5), 777–799. Doi: 10.1177/000312240907400505.Discrimination

Ratcliff, R. (1978). A theory of memory retrieval. *Psychological Review*, *85*(2), 59–108. Doi: 10.1037/0033-295X.85.2.59

Rieskamp, J., & Otto, P. E. (2006). SSL: A Theory of How People Learn to Select Strategies. *Heuristics: The Foundations of Adaptive Behavior*, *135*(2), 207–236. Doi: 10.1093/acprof:oso/9780199744282.003.0011

Sachdeva, S., Iliev, R., & Medin, D. L. (2009). Sinning saints and saintly sinners: The paradox of moral self-regulation: Research Article. *Psychological Science*, *20*(4), 523–528. Doi: 10.1111/j.1467-9280.2009.02326.x

Simão, J., & Todd, P. M. (2002, apr). Modeling Mate Choice in Monogamous Mating Systems with Courtship. *Adaptive Behavior*, *10*(2), 113–136. Doi: 10.1177/1059712302010002003

Simonsohn, U., & Gino, F. (2013). Daily Horizons Evidence of Narrow Bracketing in Judgment From 10 Years of M.B.A. Admissions Interviews. *Psychological Science*, *24*(2), 219–224. Doi: 10.1177/0956797612459762

Stewart, N., & Brown, G. D. A. (2004). Sequence Effects in the Categorization of Tones Varying in Frequency. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *30*(2), 416–430. Doi: 10.1037/0278-7393.30.2.416

Stewart, N., Brown, G. D. A., & Chater, N. (2002). Sequence effects in categorization of simple perceptual stimuli. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *28*(1), 3–11. Doi: 10.1037/0278-7393.28.1.3

Tetlock, P. E., Kristel, O. V., Elson, S. B., Green, M. C., & Lerner, J. S. (2000). The psychology of the unthinkable: taboo trade-offs, forbidden base rates, and heretical counterfactuals. *Journal of Personality and Social Psychology*, *78*(5), 853–870. Doi: 10.1037/0022-3514.78.5.853

Thaler, R. H., & Johnson, E. J. (1990). Gambling with the House Money and Trying to Break Even: The Effects of Prior Outcomes on Risky Choice. *Management Science*, *36*(6), 643–660. Doi: 10.1287/mnsc.36.6.643

Todd, P. M. (2007). How much information do we need? *European Journal of Operational Research*, *177*(3), 1317–1332. Doi: 10.1016/j.ejor.2005.04.005

Zhang, S., Cornwell, J. F. M., & Higgins, E. T. (2014, jan). Repeating the Past: Prevention Focus Motivates Repetition, Even for Unethical Decisions. *Psychological Science*, *25*(1), 179–187. Doi: 10.1177/0956797613502363