

Vysoká škola ekonomická v Praze

Disertační práce

Vysoká škola ekonomická v Praze
Fakulta podnikohospodářská
Studijní obor: Podniková ekonomika a management



Doktorská disertační práce

Eseje o ekonomii a managementu: Aplikace behaviorálních věd v organizacích

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Prohlášení

Prohlašuji, že disertační práci na téma „Eseje o ekonomii a managementu: Aplikace behaviorálních věd v organizacích“ jsem vypracoval samostatně. Použitou literaturu a podkladové materiály uvádím v přiloženém seznamu literatury. Toto prohlášení se netýká obsahu příloh práce, které jsou spoluautorským dílem.

V Praze dne 5. prosince 2016

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Poděkování

Poděkování patří mému školiteli, Luboši Smrčkovi, bez jehož ochoty a podpory bych tuto práci nejen nenapsal, ale ani bych doktorský program nestudoval. Za rady a konzultace k různým částem práce v průběhu mnoha let jsem dále vděčen (abecedně) Lídě Hadincové, Petru Koblovskému, Julii Novákové, Daniele Pauknerové, Jindřichu Špičkovi, Danielu Šťastnému, Marku Vrankovi a Lucii Vrbové. Chtěl bych poděkovat i editorovi časopisu *Journal of Management Inquiry*, Pablu Martin de Holanovi, editorovi časopisu *Society*, Jonathanu Imberovi, editorovi časopisu *The Academy of Management Perspectives*, Phillipu Phanovi, a editorce časopisu *Frontiers in Psychology*, Marii Pilar Martinez-Ruizové, za konzultace, rady a profesionální jednání; a řadě anonymních recenzentů, kteří – tu více, tu méně – přispěli k zlepšení kvality článků, které jsou obsahem této disertační práce.

Abstrakt/Abstract

Eseje o ekonomii a managementu: Aplikace behaviorálních věd v organizacích

Disertační práce se skládá ze čtyř koncepčních článků (What Comes to a Manager's Mind: Theory of Local Thinking; A Perspective on Consumers 3.0: They Are Not Better Decision-Makers than Previous Generations; Professional Identity and Dishonest Behavior; Puppet Master: Possible Influence of Parasite *Toxoplasma gondii* on Managers and Employees), které jsou aplikací teorií a poznatků behaviorální ekonomie a behaviorální etiky ve sféře manažerských nauk. Práce obsahuje úvodní sjednocující komentář, který se zabývá replikační krizí v manažerských oborech a poté spekuluje nad možnostmi behaviorální ekonomie organizace. Úvodní komentář obsahuje i shrnutí/přetisk hlavních myšlenek uvedených koncepčních článků a doplňkových empirických studií uvedených v příloze.

Essays on Economics and Management: Applications of Behavioral Science in Organizations

The thesis consists of four conceptual articles focused on application of theories and findings of behavioral economics and behavioral ethics in the sphere of managerial science (What Comes to a Manager's Mind: Theory of Local Thinking; A Perspective on Consumers 3.0: They Are Not Better Decision-Makers Than Previous Generations; Professional Identity and Dishonest Behavior; Puppet Master: Possible Influence of Parasite *Toxoplasma gondii* on Managers and Employees). The thesis contains introductory unifying commentary that deals with the replication crisis in management science and then speculates on the possibilities of behavioral organization economics. Introductory commentary contains also a summary of the main ideas presented in the conceptual articles and complementary empirical studies listed in the Appendix.

1. Technická předmluva

Disertační práce je specifická v několika ohledech. Předně, její hlavní přínos je nástin několika koncepcí, jak aplikovat poznatky a myšlenky behaviorálních věd v oblasti manažerských nauk – managementu, marketingu a řízení lidských zdrojů, přičemž tento přístup je představen ve třech publikovaných esejích (a jedné k publikaci přijaté). Separátní články do jisté míry zabraňují zcela kompaktnímu textu práce, je proto zařazena úvodní shrnující kapitola, která pomocí shrnutí/přetisku hlavních myšlenek jednotlivých článků a jejich zasazení do širšího rámce práci sjednocuje – a jelikož stejné požadavky jsou kladeny i na autoreferát k disertační práci, je tato jediná česky psaná kapitola ve formě autoreferátu (ve zbytku jinak anglicky psané disertační práci).

Dalším specifikem jsou přílohy, jež jsou ve formě dvou empirických studií, které v terénním (studie 1) a v laboratorním (studie 2) prostředí testují představené koncepce (rozvíjejí problematiku nečestnosti a podvádění z článku/kapitoly „Professional Identity and Dishonest Behavior“). Jelikož oba experimenty se mnou realizoval a studie poté sepsal tým spolupracovníků, nemohu prohlásit, že jsem je vypracoval „samostatně“ – jsou zařazeny do příloh coby empirická demonstrace užitečnosti představovaného přístupu behaviorální ekonomie organizace.

Hlavní část disertační práce se skládá z článků:

- HOUDEK, Petr. What Comes to a Manager's Mind: Theory of Local Thinking. Journal of Management Inquiry. 2016, roč. 25, č. 4, s. 359-366. ISSN 1056-4926. doi: 10.1177/1056492616640380 ISSN 1056-4926. [Impakt faktor 2015: 0,943] [SJR 2015: 0,807]

- HOUDEK, Petr. A Perspective on Consumers 3.0: They Are Not Better Decision-Makers than Previous Generations. *Frontiers in Psychology* [online]. 2016, roč. 7, č. 848. s. 1–6 doi: 10.3389/fpsyg.2016.00848 ISSN 1664-1078. [Impakt faktor 2015: 2,463] [SJIR 2015: 1,244]
- HOUDEK, Petr. Professional Identity and Dishonest Behavior. *Society*. (akceptováno) ISSN 1936-4725 [Impakt faktor 2015: 0,188] [SJIR 2015: 0,198]
- HOUDEK, Petr. Puppet Master: Possible Influence of Parasite *Toxoplasma gondii* on Managers and Employees [online]. 2016. *The Academy of Management Perspectives*. doi: 10.5465/amp.2015.0163 ISSN 1558-9080 [Impakt faktor 2015: 3,940] [SJIR 2015: 4,258]
- Přílohy se skládají z článků:
 - HOUDEK, Petr, VRANKA, Marek, NOVAKOVA, Julie, FROLLOVÁ, Nikola, POUR, Marek. Cheating Consumers in Grocery Stores: A Field Experiment on Dishonesty. (podáno).¹
 - NOVAKOVA, Julie, HOUDEK, Petr, JOLIČ, Jan, FLEGR, Jaroslav. Do People in Post-communist Countries Cheat So Much? Laboratory Study Using a Student Sample. (podáno).²

¹ Studii jsem rovněž prezentoval na Judgement and Decision Making Preconference, SPSP Convention 2016, San Diego, USA; a vědeckých workshopech FSE UJEP v Ústí nad Labem (2015) a FPH VŠE v Praze (2016).

² Studii jsem rovněž prezentoval na 14th TIBER Symposium on Psychology and Economics 2015, Tilburg, Nizozemí; vědeckých workshopech FSE UJEP v Ústí nad Labem (2015) a FPH VŠE v Praze (2016); a v semestrální práci na kurz STP915 v roce 2016.

2. Představení některých aspektů behaviorální ekonomie organizace (autoreferát)

2.1 Krize manažerských věd a behaviorální ekonomie organizace

„[Naše] teorie... postrádají vlastnosti, které umožňují hromadění vědecké znalosti. Teorie nebývají vyvráceny, ani potvrzeny, místo toho se jen postupně vytratí, jak o ně lidé ztratí zájem.“

Paul E. Meehl (1978, str. 806)

„Přehánění a falešná pozitivita výsledků dosáhly v posledních letech ve vědecké literatuře epidemiologických rozměrů. Problém přebujel v ekonomii, sociálních vědách, dokonce i v přírodních vědách... Výzkum je fragmentovaný, konkurence neúprosná a důraz je kladen na jednotlivé studie místo na ucelenější vhled... Většina výzkumu je prováděna z jiného důvodu, než je hledání pravdy.“

John P. A. Ioannidis (2011, str. 16)

Manažerské vědy se nacházejí ve stavu „krize reprodukovatelnosti“: populární manažerské koncepce stejně jako teorie vydávané v prestižních časopisech nejsou empiricky ověřovány a jejich aplikační relevance je proto diskutabilní. Podobně i poznatky vyplývající z empirických prací nejsou nezávisle replikovány. V manažerských oborech existuje extrémně nízký podíl studií, které se snaží ověřit dříve získané poznání a ty studie, které replikaci uskuteční, obvykle nepotvrdí původní výsledky. Poznatky oboru tak nemusí být hodnověrné.

Tento úvod (v následující kapitole) následuje krátké představení oboru behaviorální ekonomie organizace (v dalších kapitolách), který byl reakcí na rovněž nadměrně teoretické zaměření ekonomie a přinesl novou konceptualizaci zkoumání rozhodování lidí v organizačním kontextu. Obor představuji pomocí jedné z teorií – kognitivních rámců (resp. teorie lokálního myšlení), kterou aplikuji na rozhodování manažerů a spotřebitelů a

demonstrují, jak se z uvedených přístupů a metodik mohou manažerské obory či organizační psychologie inspirovat.

Dalším příkladem uvádím teorie behaviorální etiky. Představuji nejprve trojúhelník podvodu – predikci, že lidé více podvádějí, mají-li příležitost podvádět, motivaci podvádět a schopnost racionalizovat či omluvit své nečestné chování. Relevanci tohoto konceptuálního rámce poté ukazují na dvou experimentech, jednom laboratorním na studentském vzorku a jednom terénním na pracovnících maloobchodních podniků.

Poslední část spadá do organizační neurovědy – využití neurovědeckých poznatků ve vysvětlení některých aspektů organizačního rozhodování a dynamiky; využívám paradigmatu fyziologické manipulace člověka parazitem *Toxoplasma gondii* a spekuji nad možnými aplikacemi v manažerských oborech. V souhrnu, argumentuji, že manažerské vědy mohou být obohaceny o poznatky behaviorální ekonomie a metodologickou debatu v současnosti probíhající v psychologických vědách.

2.1.1 Na dojmech založené manažerské nauky

Složitě bychom hledali vědecký obor, v němž jsou preferované teorie a koncepce častěji výsledkem módy a popularity, než empirické validity a prediktivních schopností, než jsou manažerské a podnikové nauky. Notorickým příkladem je v 90. letech široce využívaný koncept excellence Toma Peterse a Roberta H. Watermana (z jejich knihy *In Search of Excellence* (1982)), který byl vytvořen na základě aktuálně prosperujících, modelových firem. Již několik let po vydání knihy byla polovina firem, na jejichž základě byly formulovány principy trvalé excellence, ve vážných finančních problémech. Přestože je nezbytné zohledňovat volatilitou podnikatelského ne/úspěchu, excellence se ukázala produktem přitažlivých příběhů a post-hoc racionalizace charakteristik firem, které

korelovaly s momentálním úspěchem odvětví či s formou tržní struktury; podobný osud potkal i koncept totálního řízení kvality a další univerzalistické, jednoduché a novátorské manažerské módní koncepty (Miller, Hartwick, & Le Breton-Miller, 2004).

Absence hodnověrné evidence se však neomezuje na manažerské poradenství. Z teoretických článků prestižního *Academy of Management Review* je empiricky otestováno pouhých 9 % a v bratrském *Academy of Management Journal* jich projde empirickým potvrzením toliko 6 % (Kacmar & Whitfield, 2000). Donald Hambrick stav shrnuje: „... naprostá většina publikovaných myšlenek v oboru managementu nebyla předložena naprosto žádnému empirickému testu, hrstka jich prošla jediným testem a jen nepatrná minorita myšlenek je testována opakovaně nebo různými způsoby.“ (2007, str. 1350).

Uvedené neznamena, že by empirické práce neexistovaly. Drtivá většina publikovaného poznání v manažerských naukách jsou empirické studie. Jde však často o singulární práce, jejichž závěry nejsou následně ověřovány či nezávisle replikovány (Hubbard, Vetter, & Little, 1998). V oborech managementu a marketingu zaujímal v 90. letech minulého století potvrzující výzkum méně než 5 % výzkumného výstupu, a když byla replikace vzácně uskutečněna, obvykle s více než poloviční pravděpodobností nepotvrdila původní výsledky (Hubbard & Armstrong, 1994; Hubbard & Vetter, 1996). Manažerské obory tak nejsou v popperovském smyslu vědami, jelikož se nezakládají na cílené falzifikaci hypotéz, hypotézy jen ve specifických podmínkách jednorázově verifikují. Zobecnitelnost takto získaného poznání je nutně limitovaná.

Popsaný stav může být důsledkem specifického sběru dat v hospodářské realitě – dostupnost dat je omezená a závislá na ochotě firem, zaměstnanců a zákazníků je poskytovat; případové studie jsou závislé na idiosynkratických vlastnostech firem a trhu; replikace mohou být drahé a časově náročné atp. (Devinney & Siegel, 2012) – panovalo přesto přesvědčení o nutnosti

rozvoje výzkumu, který bude ověřovat platnost existující materie znalostí (Byington, & Felps, 2016). Tato očekávání se nenaplnila; v současnosti kupř. v marketingu jen 1,2 % publikovaných studií ověřuje dříve zveřejněné poznatky, Heiner Evanschitzky s kolegy svoji zprávu o empirické verifikaci uvnitř manažerských věd proto zakončují: "... manažeři by měli být skeptičtí k rozhodnutím založených na zjištěních, které jsou publikovány ve vůdčích marketingových časopisech a jež v naprosté většině pramení z jednorázových studií. Učitelé by ve svých přednáškách neměli vkládat tolik víry v publikovaná zjištění. A konečně, mnoho výzkumníků si nepřipouští myšlenku, že za absence replikačního výzkumu stojí behaviorální a manažerské vědy na křehkých základech." (Evanschitzky, Baumgarth, Hubbard, & Armstrong, 2007, str. 413). Uvedené závěry i statistiky lze považovat za přestřelené, jelikož neexistuje ustálená norma, co ustanovuje replikaci – kupř. různé formy konceptuální replikace testují efekt za jiných kontextů, v jiné operacionalizaci, mnohdy různě modifikovaný a nelze očekávat, že meta-studie nutně identifikují, že jde o replikaci, resp. že síla efektů bude blízká původním výsledkům (Hendrick, 1990). Na druhé straně se objevuje notorická námitka, že je-li teorie natolik flexibilní a vágní, že je schopna akumulovat téměř jakékoliv výsledky, je smysluprázná.³

Ve zkratce řečeno, manažerské obory jsou prodchnuty teorií s potenciálně nízkou empirickou validitou, většina závěrů studií není nezávisle ověřována a většina z těch, které ověřovány

³ „Jakmile formulována, má teorie mnoho zachránců [zabraňujících jejímu vyvrácení]. Předně je nepravděpodobné, že by přitáhla kritiku ostatních výzkumníků, protože ti jsou zaujati svými vlastními teoriemi. Za druhé, je-li teorie kritizována, ukáže se kritika téměř vždy špatně pochopená a teorie přetrvá ve své původní pobobě. Za třetí, při vzácných okamžicích, kdy kritika vyvolá potřebu reakce, jednoduchá modifikace teorie postačí. Šance, že teorie bude opuštěna nebo výrazně modifikována kvůli kritice, je proto prchlavě nízká. Výzkumníci si mohou být jisti, že jejich teorie přežijí tak dlouho, jak jen je budou podporovat.“ (Watkins, 1990, str. 328).

jsou, se nedaří replikovat. Uvedený stav způsobuje řada provázaných důvodů, které zde shrnu jen velmi krátce.

2.1.2 Důvody, proč manažerský výzkum nebývá replikován

Z podstaty manažerských nauk coby sociálních věd vyplývá, že se věnuje komplexním otevřeným systémům, které se historicky vyvíjejí; skládají se z agentů s variantní reprezentací minulosti, jež dynamicky spoluvytvářejí variantní interpretace daného systému, podle nichž se chovají (Tsang & Kwan, 1999). V takovém prostředí je možnost formulace detailních kauzálních závislostí nepodobná fyzikálním vědám a je nutně omezená. Generalizovatelnost experimentální evidence je problematická, jelikož externí validita zjištění či síla efektů je závislá na mnoha exogenních faktorech. Existují efekty natolik silné, že je lze identifikovat napříč různými kontexty – jako například vzájemné ovlivňování kolegů při pracovní produktivitě (Mas & Moretti, 2009), nicméně většina zkoumaných vlivů má mnohem subtilnější sílu. Korelativní evidence přítomná v případových studiích je pak notoricky jen návodná.⁴

Neochota realizovat či publikovat replikační práce je založena na silně pokřivené motivační struktuře (nejen) manažerských věd. Univerzálně panuje dojem, že replikace potvrzující dřívější zjištění nepřináší nové poznání, a proto pozitivní replikační studie nemají důvod být publikovány; rovněž tak na neochotě publikovat studie, které jsou v opozici k předchozím zjištěním s odůvodněním, že replikace je metodologicky vadná a negativní výsledky jsou jen artefaktem; replikační výzkum je považován za méněcenný odbornými časopisy, kolegy i institucemi; a konečně mnohé poznatky nelze replikovat (vyjma provedení konceptuální

⁴ Vizte i (Hayek, 1988, 1995) k diskuzi, zda lze aplikovat (experimentální) nástroje přírodních věd na sféru společnosti.

replikace), jelikož jsou závislé na komplexních mediátorech typu národní či firemní kultury, historických událostech atp. (Singh, Ang, & Leong, 2003; Byington, & Felps, 2016). Oceňován je naopak originální výzkum, který mnohdy bývá zúžen na dosažení signifikantních výsledků při testování vůči nulovým hypotézám – praxe, při níž jsou vědci implicitně motivováni k užívání metodologických praktik, které vedou k signifikantním výsledkům, nikoliv nutně k validnímu a robustnímu poznání.

Nereplikovatelnost studií ovlivňuje mnoho metodologických faktorů. Některé jsou inherentní povaze společenských věd, jak zmiňováno výše, další vyplývají z tzv. problematických výzkumných praktik (Gelman, 2015; John, Loewenstein, & Prelec, 2012; pro diskuzi uvnitř manažerských nauk vizte Byington, & Felps, 2016; Bergh, Sharp, & Li, 2016). Ač patrně vzácně, dochází k záměrnému falšování části či všech dat nebo jejich analýz (Stroebe, Postmes, & Spears, 2012) a k chybám při zpracování a vyhodnocení dat – na falza a chyby se přitom přichází spíše náhodou. Chybí systematické testování, zda data a analýzy nevykazují znaky implikující jejich možné falšování (Simonsohn, 2013).⁵ Meta-studie ověřující konzistenci statistických testů přitom naznačují, že až polovina publikovaných článků v psychologii vykazuje nějakou nekonzistenci; statistické testy a prohlášení o signifikanci

⁵ Ilustračním příkladem může být prominentní stažení studie od Michaela LaCoura a Donalda Greena (2014) otištěné v časopise *Science*, která údajně demonstrovala, že použije-li agitátor osobní příběh, pak vyvolané pocity empatie mohou dlouhodoběji změnit respondentův názor na politickou agendu týkající se daného člověka než pouze popis, jak politická agenda ovlivňuje životy lidí (ve studii na příkladě gaye a podpory manželství osob stejného pohlaví). Snaha o replikaci výsledků od nezávislého týmu (Broockman, Kalla, & Aronow, 2015) však vedla k bezprostřednímu odhalení, že některá data nebyla nasbírána (společnost, která je měla nasbírat, o podobném výzkumu nevěděla), resp. nemohla být získána, jak bylo prezentováno (byla příliš podobná jinému datasetu) a jsou proto zjevně zfalšovaná. Po odhalení těchto nesrovnalostí Greenův článek stáhl s odůvodněním, že s původními daty nepracoval a kritika publikovaných výsledků je odůvodněná. LaCour, který byl za sběr dat zodpovědný, se k stažení článku nepřidal. Dále vizte i kap. 5.6.

výsledků jednoho z osmi článků jsou pak natolik nekonzistentní, že závěry daných studií mohou být zpochybněny (Nuijten, Hartgerink, van Assen, Epskamp, & Wicherts, 2015).

Patrně nejrozšířenější problematické výzkumné praktiky jsou „rybaření signifikantních p-hodnot“ (p-value fishing) a „hypotézování poté, co jsou výsledky známy“ (HARKing-Hypothesizing After the Results are Known). Výzkumníci mají v průběhu testování hypotéz volnost volby analyzovaných dat (jak u výběru proměnných, tak jejich počtu) i způsobů jejich následné statistické analýzy. Mnohočetnými testy na různých datech lze však téměř vždy dospět k nějakým statisticky signifikantním výsledkům a k takto získaným výsledkům lze ex post připojit vysvětlující teorii. Nepřizná-li vědec, že podobné rybaření využil a neprovede-li statistickou korekci na mnohočetné porovnání, nutně dochází k epidemii chyb I. typu; pozitivně falešné signifikanci dané náhodou (Bettis, 2012; Simmons, Nelson, & Simonsohn, 2011). Kvůli publikačnímu zkreslení budou publikovány tyto ad hoc vytvořené příběhy s falešnou pozitivitou než negativní výsledky a priority formulovaných hypotéz a způsobů analýzy dat (Ferguson & Heene, 2012; Francis, 2012; Leung, 2011). Není proto překvapivé, že v oborech jako psychologie, manažerské vědy či ekonomie více než 90 % publikovaných studií potvrdí formulované hypotézy, což implikuje míru úspěšnosti predikovat budoucí výsledky blízkou jasnozřivosti; jde však spíše o důsledek publikačního zkreslení a vytváření hypotéz poté, co jsou empirické výsledky zřejmé (Bones, 2012; Fanelli, 2012; Kerr, 1998). Vzhled do rozšířenosti podobných praktik v manažerských oborech dává studie (O'Boyle, Banks, & Gonzalez-Mulé, 2014), jež porovnávala data, hypotézy a analýzy publikované v disertačních pracích z manažerských oborů a následně stejné analýzy publikované s odstupem v odborných časopisech. O'Boyle s kolegy zjistili, že se více než zdvojnásobila míra prokázaných a neprokázaných hypotéz. Autoři z analýz poslaných do odborných časopisů odstranili statisticky nesignifikantní hypotézy, naopak přidali signifikantní či modifikovali analyzovaná data.

Replikující vědec nemá podobnou flexibilitu, jelikož postupuje dle publikované, finální metodiky a jeho snaha o ověření efektu, který nejspíše neexistuje a byl „objeven“ pomocí problematických praktik, pak vyústí v negativní výsledek. Bez publikací replikačních studií je však odborná literatura zaplevelena efekty, které v realitě neexistují, resp. jsou síly efektů přeceňovány; ze stejného důvodu jsou i výsledky meta-studií diskutabilní. Kupř. studie (Harrison, Banks, Pollack, O'Boyle, & Short, 2014) ukazuje, že kvůli podobnému publikačnímu zkreslení je až o 30 % přeceňován vliv i běžných indikátorů firemní výkonnosti (jako je odměna CEO, marketing, lidské zdroje atp.).⁶

Majorita výzkumníků pracujících v oboru managementu přitom uvádí, že mají znalost o užívání problematických výzkumných praktik; 77 % má vědomí o „užívání jen těch dat, které podporují hypotézu a nevyužívání těch, co ji nepodporují“, 50 % má vědomí o „nevyužívání dat, které jsou v rozporu s předchozím výzkumem“ a 99 % má vědomí o „vytváření hypotéz poté, co jsou výsledky známy“; konečně, o fabrikaci dat údajně ví 27 % respondentů postgraduálních obchodních fakult (Bedeian, Taylor, & Miller, 2010, str. 716).

V posledním desetiletí začínají být uvedené problémy cíleně řešeny. Zejména psychologie (a tedy odvozeně i organizační psychologie, behaviorální ekonomie a manažerské nauky) využívá tzv. „krizi reprodukovatelnosti“ k ustanovení nových metodologických doporučení, které mají zabránit stavu, dnes panujícímu, kdy většinu publikovaného poznání není možno nezávisle replikovat (Asendorpf et al., 2013; Open Science Collaboration, 2015; Pashler &

⁶ Dalším notorickým příkladem může být test podmíněného zvažování agresivity užívaný pro detekci kontraproduktivního, agresivního chování na pracovišti. Původní studie prokázala koeficient validity 0,44, následná metaanalýza stanovila odhad stejného koeficientu na 0,16 a poslední metaanalýza kontrolující na publikační zkreslení končí odhadem 0,08 (Kepes, Bennett, & McDaniel, 2014).

Harris, 2012).⁷ Mezi hlavní doporučení patří pre-registrace konkrétní metodiky a hypotéz, aby bylo zabráněno ex post formulaci hypotéz a rybaření signifikantních hodnot (či nutnost explicitního uvedení, že práce je observačního charakteru). Dále je doporučována plná transparence užitých metod a dat, aby byla možná nezávislá reprodukce původních výsledků (přestože mnohé vědecké instituce či vydavatelství vyžadují, aby autoři zveřejnili data či je poskytli, je-li o ně žádáno, naprostá většina vědců tuto povinnost neplní (Wicherts, Borsboom, Kats, & Molenaar 2006)). Dále, změření na studie umožňující vysoké síly testů, nárůst počtu publikací registrovaných replikačních studií, publikace negativních výsledků, explicitní stanovení, zda bude výzkum observační či konfirmační studií ad. Uvedná doporučení se přitom musí spojit se změnou publikační kultury, v níž by pravidla transparentnosti měla být vynucována editory či oponenty odborných časopisů. I v manažerské literatuře nabývá na významu management založený na ověřených důkazech (Kepes, Bennett, & McDaniel, 2014; Pfeffer & Sutton, 2006) a přední časopisy, jako *Academy of Management Learning & Education* či *Strategic Management Journal*, věnují speciální čísla replikačním snahám (Bettis, Helfat, & Shaver, 2016).

2.2 Behaviorální ekonomie organizace

Paralelně s uvedeným vývojem do manažerských oborů zasáhla behaviorální ekonomie. Obor, který vnáší do tradičních ekonomických modelů a předpokladů, jejichž aplikovatelnost se rovněž ukázala problematická, vhledy z ostatních společenských věd, zejména z psychologie (Rabin, 1998; DellaVigna, 2009), ale i neurověd (Houdek, 2008). Behaviorální ekonom stále předpokládá, že lidé usilují o nejvhodnější volby (maximalizují svůj užitek) a

⁷ Mezi nereplikované typicky patří studie využívající priming, ať již sociální (Doyen, Klein, Pichon, & Cleeremans, 2012), mezosobní (Cheung et al. 2016) či instrumentální, např. penězi (Rohrer, Pashler, & Harris, 2015). Jak bude pojednáno později v této kapitole, studie založené na teorii vyčerpaného ega rovněž nebývají replikovány (Hagger, & Chatzisarantis, 2016).

využívá metodické přístupy ekonomie, testuje však explicitně formulované mentální modely či okolnosti, které mohou ovlivnit, že lidé za specifických situací optimálních voleb nedosáhnou. Behaviorálně-ekonomický model rozhodování tak zohledňuje specifické vlivy kontextu, emocí a intuice či zvažování preferencí ostatních atp. (Laibson, & List, 2015).

Ať již se studie formálně přihlásí k behaviorální ekonomii organizace (Camerer & Malmendier, 2007; Houdek & Koblavský, 2016, in press), experimentální organizační ekonomii (Camerer & Weber, 2013), behaviorálním korporátním financím (Baker & Wurgler, 2013) či behaviorální industriální organizaci či behaviorální ekonomik inspirovanému marketingu (Grubb, 2015a, 2015b; Houdek, 2016), jde o práce využívající vzhled psychologie do způsobů vnímání, usuzování a rozhodování lidí. Toto poznání poté testují na volbách lidí v prostředí organizací, v jejich zastoupení či při tržních transakcích.⁸

Při studiu rozhodování manažerů, je „[v]ýchozí předpoklad... prostý, ... rozhodování manažerů (a nejen ono) nepodléhá dostatečnému dohledu či přezkoumání, ať již kvůli neúčinným pravidlům organizačního řízení či nedostatečné vlastnické kontrole. Volby manažerů proto mohou být ve vleku jejich specifických rizikových preferencí či obecných rozhodovacích heuristik a chyb, které negativně ovlivňují finanční zdraví firmy.“ (Houdek & Koblavský, 2016, str. 33). Jsou tedy identifikovány silné psychologické efekty ovlivňující, jak se lidé rozhodují a testováno, zda a v jakém rozsahu se vyskytují i v organizační praxi, resp. „rozhodovací chyby v organizacích dávají vzniknout inspirativním výzvám, jak má být

⁸ Je vhodné zmínit, že aplikace behaviorální ekonomie na sféru organizace, korporátního řízení, marketingu atp. je často poplatná rozšiřování ekonomického přístupu či psychologických zjištění na organizační sféru a někdy do jisté míry ignoruje v manažerských oborech přítomné koncepce či konstrukty, které se zabývají podobnými či identickými fenomény. Typicky behaviorální organizační ekonomie a organizační psychologie jsou fakticky stejné přístupy používající mírně odlišnou konceptualizaci problémů či odlišný jazyk.

organizace uspořádána, aby příslušné chyby opravovala či využívala...” (Camerer & Malmendier, 2007, str. 236).

Podobně ani spotřebitel se nesoustředí na všechny atributy koupě výrobku, některé informace jsou zvýrazněny, jiné potlačeny a některé jím nejsou vůbec zpracovávány. I kdyby byly všechny informace spotřebitelem zvažovány, budou pro něho mít odlišné váhy dle své výraznosti, resp. dle kognitivního rámce, v kterém jsou zpracovány. Popsané behaviorální chyby na straně spotřebitelů často vedou k neoptimálnímu rozhodování, které firmy dále ziskově prohlubují (Grubb, 2015b).

2.3 Teorie lokálních kognitivních rámců⁹

Oba články/kapitoly „What Comes to a Manager's Mind: Theory of Local Thinking“ (kap. 3.) a „A Perspective on Consumers 3.0: They Are Not Better Decision-Makers than Previous Generations“ (kap. 4.) jsou aplikací teorie lokálních kognitivních rámců (resp. teorie lokálního myšlení) na rozhodování manažerů, resp. zákazníků.

Jak píše v úvodu článku/kapitoly o manažerském rozhodování: když okres, kde firma sídlí, minul hurikán, firmy začnou krátkodobě hromadit likviditu (Dessaint & Matray, 2014). Pakliže roste počet bankrotů, manažeři firem z různých sektorů v blízkosti 100 km od sídla bankrotující firmy začnou snižovat investice i míru zadluženosti (Addoum, Kumar, Le, & Niessen-Ruenzi, 2015). Je-li manažer upozorněn na normu, již musí pracovníci jeho týmu splnit, zvýší se produktivita týmu (Englmaier, Roider, & Sunde, 2014). Ani jeden z těchto příkladů není překvapivý, přestože by měl. Příchod hurikánů se řídí dlouhodobě stacionárním rozdělením, takže objevení se hurikánu nenese žádnou novou informaci o místě příchodu

⁹ Následující kapitoly autoreferátu kopírují (překládají) i text z publikovaných článků/dalších kapitol disertační práce. Prohloubení diskuze čtenář nalezne v příslušných kapitolách.

dalšího. Geograficky blízké bankroty sice mohou vypovídat o šoku v lokální ekonomice, nicméně finanční strategie firem vzdálených o něco dále než 100 km se již nemění – lokální hospodářský cyklus vysvětlením nástupu konzervativní finanční strategie tedy spíše není, protože ekonomické podmínky zjevně dosahují dále než stovku kilometrů. A konečně, manažeři o příslušné výrobní normě vědí, pracují dle ní po mnoho let a jsou na jejím splnění přímo finančně motivováni, takže pouhé upozornění na opatření, které znají, by již dále nemělo posílit jejich motivace.

Uvedené případy jsou vysvětlitelné dočasnou významností informací, kvůli nimž manažeři krátkodobě přeceňují likvidní či finanční riziko, nebo intenzivněji vnímají produkční cíl. Jejich volba je činěna na základě charakteristik, ke kterým byla přitáhuta pozornost, tedy charakteristik, které byly v konkrétním kontextu volby výrazné. Toto, tzv. lokální myšlení, znamená posuzování situace, během něhož je pozornost selektována dle bezprostředně výrazných faktorů v rozhodovacím kontextu. Může jít o extrémní nebo nedávné informace, o informace, které kontrastují s existujícími očekáváními vyplývajícími ze statutu quo nebo jsou vychýlené selektivním vzpomínáním a omezeným vnímáním. Stejně tak mohou pozornost vychylovat specifické osobní vzpomínky, které trvale vychýlí způsob získávání a zpracování informací. Podobně i primární pracovní zkušenosti dokáží výrazně ovlivnit dlouhodobé chování lidí.

Tyto předpojatosti a informace již nemusí být relevantní pro aktuální rozhodování. I když si manažeři mohou být vědomi měnících se podmínek i svých preferencí, neprovedou dostatečnou mentální korekci na to, že výrazné faktory nebudou obecně či v budoucnu natolik působit, respektive že existují i dalších důležité faktory a budoucí okolnosti mohou být odlišné.

Jak ukazuje studie s příchodem hurikánů (Dessaint & Matray, 2014), náhlá význačnost rizika likvidity způsobená průchodem hurikánu ve vedlejší okrese přiměla manažery ke zvýšení držby hotovosti (tedy určité formy firemního obecného pojištění), ačkoli nic nenaznačovalo, že objektivní riziko přírodního neštěstí je větší než dosud. V průběhu 12 měsíců po hurikánu firmy se sídlem v blízkých oblastech dopadu hurikánu průměrně zvýšily svou držbu likvidity o 0,84 procentního bodu celkových aktiv ve srovnání s firmami, které sídlily dále (a hurikán pro ně nebyl natolik výrazný). Zvýšení likvidity je krátkodobé, netrvá ani rok a poté se vrací na původní úroveň, s tím jak významnost minulého hurikánu vyprchává. Chybou více trpí manažeři firem bez předchozí zkušenosti s hurikánem a manažeři malých a mladých firem, tedy více nezkušení. To, že se jedná o autentický efekt, ukazuje i podobné zjištění studie v případě zemětřesení. Manažeři amerických firem, které sídlí v oblastech, v nichž se objevuje zemětřesení, reagují stejným zadržováním likvidity, nastane-li někde jinde ve světě (mimo USA) zemětřesení. To mj. vylučuje, že za reakcí firem může stát regionální hospodářský přeliv přírodního neštěstí, ale spíše přeceňování emočně výrazné události. Dessaint a Matray rovněž dokazují, že podobné chování snižuje hodnotu firem pro akcionáře. Více vizte v příslušné kapitole.

Logika studia chování spotřebitelů je analogická; jak uvádím v příslušné kapitole: Ve dnech, které jsou vůči průměrným teplotám mimořádně teplé a bez oblačnosti, kupují zákazníci častěji kabriolety a ve dnech, v nichž napadne mnohem více sněhu než obvykle, kupují více auta s pohonem na čtyři kola, vše při kontrole na geografii a roční období (Busse, Pope, Pope, & Silva-Risso, 2015). Rozhodnutí o koupi typu auta bylo podpořeno příhodným počasím – někteří zákazníci počasí chybně extrapolovali, resp. ocenili vlastnosti, které byly za daného počasí distinktivně výhodnější. Uvedené vozy jsou pak rychleji vráceny zpět na sekundární trh, což ukazuje, že majitelé postupně došli k uvědomění, že udělali chybu, když se jejich predikce o oblíbenosti či užitečnosti auta ze dne koupě souhrnně (v odlišných dnech)

nenaplnila. Podobně platí, že se lidé pojišťují proti událostem s vysokou pravděpodobností nastání a slabými důsledky než proti málo pravděpodobným událostem s katastrofickými dopady; k pojištění se navíc uchylují po zprávách o dané události a ochota pojišťovat se slábne, jak se vzpomínky na ni vytrácejí (Browne, Knoller, & Richter, 2015; Gallagher, 2014).

Očekávání spotřebitelů jsou dána lokálním zpracováváním informací, které je ovlivněno silnými osobními či primárními vzpomínkami a vzpomínkami z nedávné či frekventované spotřeby. Očekávání jsou dále ovlivňována měnící se náladou a emocemi a momentálně významnými externími okolnostmi. Tyto předpojatosti pak často vedou ke spotřebnímu rozhodování, které vede k předpověditelným chybám. Více vizte v příslušné kapitole.

2.4 Behaviorální etika a faktory ovlivňující nečestnost (nejen) v organizačním prostředí

2.4.1 Trojúhelník podvodu

Důležitost etického jednání na správnou funkci organizace je trvale relevantní téma sociálních věd a společenští vědci stvořili velkou sumu znalostí o determinantech ne/etického chování (Kish-Gephart, Harrison, & Treviño, 2010; Torsello & Venard, 2016; Treviño, Weaver, & Reynolds, 2006). Článek/kapitola “Professional identity and dishonest behavior” (kap. 5.) představuje trojúhelník podvodu: jednoduchý nástroj auditorů při identifikaci hrozby podvodu. Jde o tři obecné okolnosti, které vedou k zvýšené pravděpodobnosti nečestného chování. Lidé podvádějí, pakliže mají i) příležitost podvádět, ii) motivaci podvádět, a iii) schopnost racionalizovat či omluvit své nečestné chování.¹⁰

¹⁰ Někdy se mluví o tzv. „diamantu (čtverci) podvodu“ (Wolfe, & Hermanson, 2004), v němž jsou vedle zmíněných faktorů zvažovány i „schopnosti“ či „osobní vlastnosti“, které umožňují či usnadňují nečestné chování. Pachatel podvodu musí být například natolik inteligentní, aby byl schopen naplánovat přečin, aniž by byl lehce odhalitelný; musí mít

Cílem eseje je ukázat, že trojúhelník podvodu je relevantním nástrojem pro popis chování profesionálů i v oborech, které jsou obecně považovány za posláním, v kterých se dbá o vysokou míru profesionality a normy správného chování jsou v nich více významné či vynucované; obory jako lékařství, učitelství, věda či duchovenstvo. V eseji využívám soudobého rozvoje forenzní ekonomie (Zitzewitz, 2012) a behaviorální etiky (Bazerman & Gino, 2012; Pierce & Balasubramanian, 2015). Obory pomocí analýzy reálných dat a řízených terénních experimentů odhalují rozsah tajného chování lidí a faktory, které ovlivňují, jak se lidé rozhodují a chovají v situacích, v kterých potenciálně porušují legální či morální normy.

2.4.2 Motivace a příležitost podvádět

Dvě strany trojúhelníku jsou zřejmé; příležitost podvádět se pojí se špatnou organizací skupiny lidí, firem či úřadů, které neustanoví vhodné normy chování, nevynucují je, popř. je vynucují neefektivně. Další příležitosti k podvodu nabízejí nevýhody, ať již informační, vyjednávací či preferenční, protistrany – ať již zákazníka či dozorového orgánu. Pakliže protistrana nedokáže adekvátně ohodnotit hodnotu služby či zboží, nabízejícímu vzniká příležitost využít této situace ke své výhodě. Podobně tak motivace; motivace získat statky, na které by čestnými prostředky člověk jinak nedosáhl, je zřejmým důvodem k nemorálnímu chování. Zvětšuje-li se odměna z podvodného chování, roste i motivace se jej účastnit. Pro mnoho lidí je naopak motivace k nečestnému chování spjata s aktuálními problémy ve finanční či osobní rovině, které se snaží podvodným chováním vyřešit. Mnoho zaměstnanců

dostatečné sebevědomí a/nebo schopnost působit na ostatní tak, aby jeho činy nepůsobily podezřele či aby nebyly odhaleny. Musí být schopen lhát a přetvářovat se, aniž by působil neautenticky atp. Empirický výzkum potvrzuje, že přívětiví a svědomití lidé mají výrazně slabší tendenci podvádět (Giluk, & Postlethwaite, 2015) než lidé vykazující “temnou triádu” poruch osobnosti; machiavellismus, narcismus či psychopatii (Williams, Nathanson, & Paulhus, 2010).

začne zpronevěřovat firemní peníze, protože mají problémy s dluhy z gamblingu nebo nemají finanční zdroje na pokrytí své drogové závislosti nebo rozvodu.

V naší studii „Do People in Post-communist Countries Cheat So Much? Laboratory Study Using a Student Sample.” (Novakova, Houdek, Jolič, Flegr, Příloha 2) jsme zkoumali, zda příležitost podvádět bude studenty využita a které motivace budou při nečestném chování hrát roli. Cílem studie bylo zjistit intenzitu podvádění studentů pocházejících z postkomunistické země, zejména s ohledem na práci Arielyho et al. (2014), kteří zjistili, že obyvatelé SRN s rodinným zázemím z bývalého východního Německa podvádějí více než původní obyvatelé západního Německa. Řada dalších studií přitom ukázala, že obyvatelé postkomunistických zemí obecně méně důvěřují druhým lidem (Bjørnskov, 2007), mají větší tendenci podvádět a uplácet (Hrabak et al., 2004; Kuběna, Houdek, Lindová, Příplatová, & Flegr, 2014).

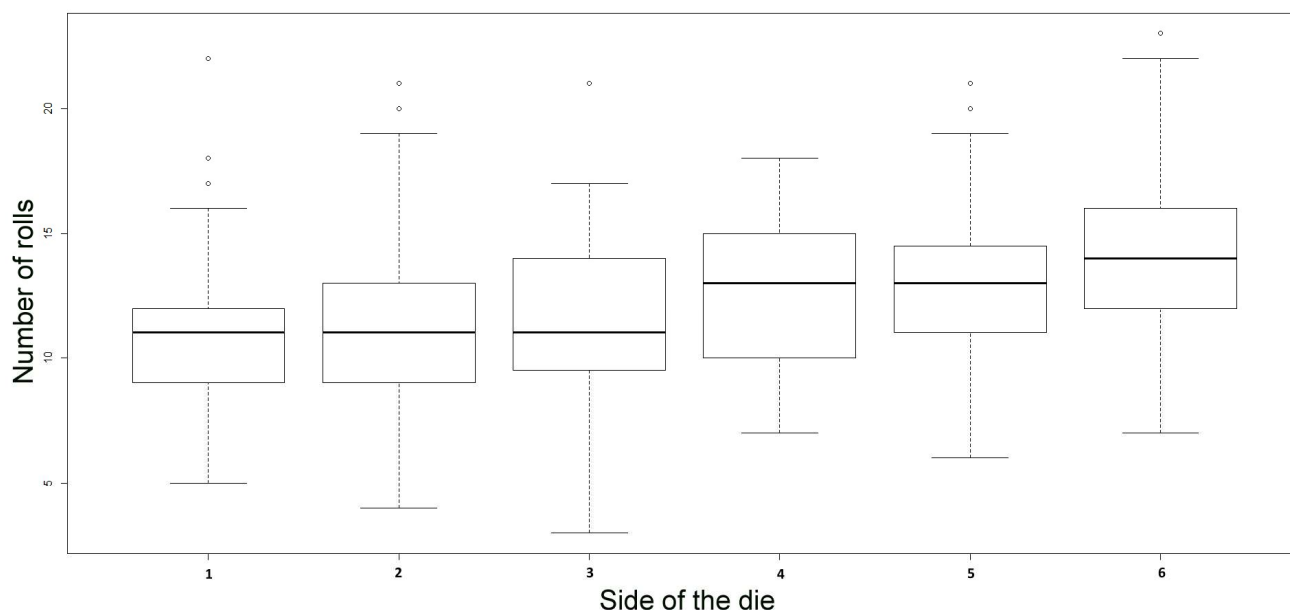
Stejně jako Ariely et al. (2014) jsme využili experimentální paradigma „házení kostek za peněžní odměnu“, laboratorní design často využívaný pro zjištění tendencí k nečestnosti (Fischbacher & Föllmi-Heusi, 2013; Hanna & Wang, 2013; Ruffle & Tobol, 2016). V experimentu jsou jeho participantů odměňováni dle počtu bodů, které na kostce naházejí. Výsledky házení přitom reportují sami, je jim tak umožněno podvádět a nahlásit více bodů, než jim padlo. Míra podvádění je měřena počtem naházených bodů (resp. souhrnně odlišností od teoretické střední hodnoty dosažitelných bodů).¹¹ Kromě samotné deskriptivní statistiky o

¹¹ Každý účastník experimentu byl vyzván, aby hodil 40krát spravedlivou šestistrannou kostkou (kalibrována pro použití v kasinu) a zaznamenal do softwarového rozhraní počet obdržených bodů z každého hodu. Participantů mohli podvádět tím, že napíší více bodů, než skutečně hodili (očekávaný průměr hodů by se měl pohybovat kolem $3,5 = (1+2+3+4+5+6)/6$, celkově kolem 140). Část odměny za účast na experimentu byla závislá na počtu naházených bodů, za každý bod participantů získávali 5 žetonů reprezentujících 0,5 Kč, mohli si tedy v tomto experimentu zhruba vydělat $140 \times 0,5 = 70$ Kč. Participantů v kontrolní skupině se při házení kostek vzájemně viděli, jelikož seděli u společného stolu. Navíc byli v místnosti přítomni 4 experimentátoři, kteří dohlíželi na experiment. Participantů v experimentální

intenzitě podvádění měříme i některé faktory, které s podváděním souvisejí jako vliv anonymity, pohlaví či úroveň kognitivních schopností. Dřívější studie ukázaly, že muži se v řadě situací chovají nečestněji než ženy (Barfort, Harmon, Hjorth, & Olsen, 2015; Friesen & Gangadharan, 2012; Muehlheusser, Roider, & Wallmeier, 2015) a kognitivně schopnější lidé snadněji poznají příležitosti, v kterých lze získat osobní výhodu, mohou proto také častěji lhát a podvádět (Bloodgood, Turnley, & Mudrack, 2008; Gino & Ariely, 2012).

Zjistili jsme, že ačkoliv participantů mírně podváděli (vizte Graf 1.), nelze uzavřít, že by experimentálně kontrolované podmínky větší anonymity či další sledované proměnné jako věk, pohlaví či míra inteligence míru podvádění ovlivňovaly. Uvedené výsledky jsou však silně poplatné nízké síle testů, malému a specifickému vzorku participantů a umělé úloze zkoumající tendenci k nečestnosti. S ohledem na dřívější studie, které identifikovaly intenzivnější tendence k nečestnosti obyvatel z postkomunistických zemí, však lze spekulovat, že mladá generace už natolik nemusí být ovlivněna faktory, které se podílely na větší míře nečestnosti v těchto zemích.

skupině naopak seděli v uzavřených boxech a vzájemně na sebe neviděli. Dva experimentátoři byli přítomni při vchodu do místnosti, kde setrvali pro případné dotazy. Neviděli však participanty sedící v boxech.



Graf 1. Počet reportovaných hodů pro jednotlivé strany kostky, které participant experimentu uvedli. Hody u jednotlivých stran se signifikantně liší (Kruskal-Wallis chi-sq.=50.82, df=5, $p<0.0001$).

2.4.3 Racionalizace podvodu a další behaviorální tendence

Poslední strana trojúhelníku podvodu – schopnost racionalizace nečestného chování, je mnohdy opomíjeným faktorem podporujícím či umožňujícím rozvoj nečestnosti. Racionalizace či obhájení je mentální proces, který sladí vlastní morálně pochybné chování s osobními hodnotami či etickými zásadami tak, že člověk si připadá morální, i když se chová nečestně (Shalvi, Gino, Barkan, & Ayal, 2015). V posledních letech se behaviorální etika a morální psychologie zaměřily na výzkum schopnosti racionalizovat své nečestné chování – identifikovaly řadu faktorů, které ovlivní, že se lidé zachovají nečestně (Bazerman & Gino, 2012; Dinh & Lord, 2013; Moore & Gino, 2013), a to i přestože mají upřímnou motivaci udržet si vysoký morální standard (Barkan, Ayal, & Ariely, 2015). Teorie etické disonance predikuje, že situace či podmínky, které znejasní, že chování člověka poruší morální normu (u očekávané nečestnosti) či faktory, které mohou “omluvit” porušení normy (prožívání viny či lítosti), vyvolají nárůst nečestného chování. Studie ukazují, že podepsání akademického

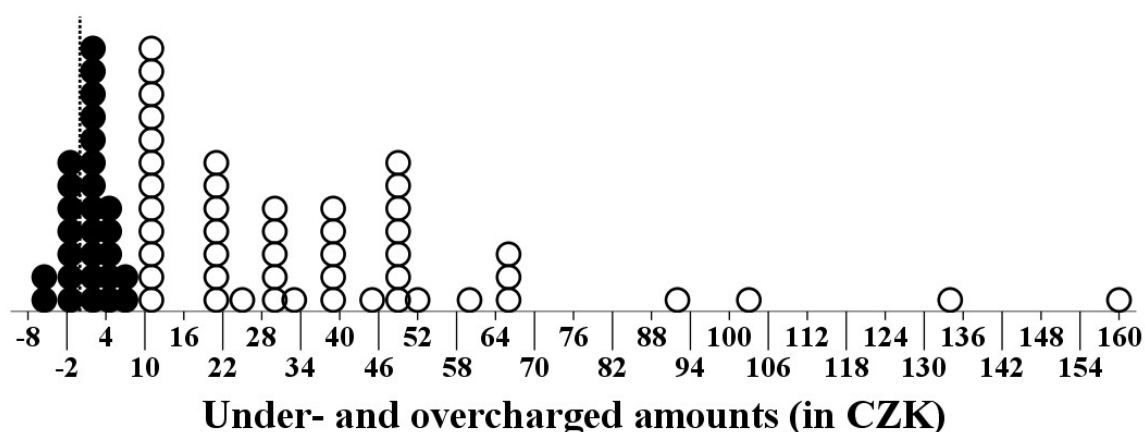
slibu zdůrazní morální hodnoty studentů a sníží jejich podvádění (Mazar, Amir, & Ariely, 2008), podepsání formuláře v úvodu (a nikoliv na konci) přivede pozornost k identitě vyplňujícího a zvýší jeho následnou pravdomluvnost (Shu, Mazar, Gino, Ariely, & Bazerman, 2012), lidé se chovají více nečestně, pakliže „podvádějí“ než když „jsou podvodníky“ (Bryan, Adams, & Monin, 2013), popřípadě pouhý obrázek sledujících očí zvýší příspěvky do společné kasičky na nákup občerstvení (Bateson, Nettle, & Roberts, 2006).

Schopnost racionalizovat vlastní podvodné chování je mediováno řadou faktorů, ať již vědomě či podvědomě působících; společně ovlivňují schopnost či ochotu lidí zachovat se nečestně. Jedním z faktorů, který v naší studii „Cheating Consumers in Grocery Stores: A Field Experiment on Dishonesty“ (Houdek, Vranka, Novakova, Frollová, Pour, Příloha 1) testujeme coby determinantu míry nečestnosti, je denní doba. I přes nedávné kontroverze o platnosti teorie vyčerpaného ega (Carter & McCullough, 2013; Hagger & Chatzisarantis, 2016) se zdá, že rozhodování a činění voleb v průběhu dne postupně omezuje mentální kapacity člověka a oslabují se tak jeho sebekontrolní mechanismy (Vohs et al., 2014). Vyčerpání sebe-regulačních mentálních sil ovlivňuje i rozhodování v etických dilematech, morální normy ztrácejí na intenzitě a nečestné jednání se stává pro jednotlivce snazší (Gino, Schweitzer, Mead, & Ariely, 2011). Na základě těchto poznatků (Kouchaki & Smith, 2014) predikovali a ve čtyřech experimentech potvrdili, že v průběhu dne se vyčerpá schopnost lidí čelit pokušením zachovat se morálně a odpoledne či večer se chovají více nečestně. Tento „efekt ranní morálky“ (Morning Morality Effect, MME) podporují i situační faktory, jako třeba větší temnota večer (Chiou & Cheng, 2013). Ve své terénní studii jsme proto mj. sledovali, zda tendence k nečestnému chování pokladních bude ve večerních a nočních hodinách vyšší než dopoledne a ráno (dalšími sledovanými faktory bylo pohlaví figurantů a pokladních a intenzita pozornosti figurantů věnovaná placení).

V naší studii pro přímé stanovení intenzity nečestnosti zaměstnanců maloobchodu využíváme terénní metodu přeplacení za zboží. V tomto designu zákazníci-figuranti v obchodech nakupují zboží a přeplácejí jeho cenu. Sledovanou mírou nečestnosti je, zda prodavač přeplatek vrátí. V mezinárodní komparativní studii Feldman (1968, experiment IV.) zjistil, že pokladní výrazně okrádají tuzemce i zahraniční turisty; od 27 % v Bostonu do 54 % pokladních v Paříži si nechalo přeplacenou částku. Podobně (Rabinowitz et al., 1993) zkoumali, zda v Salzburgu, v Rakousku si prodejci suvenýrů ponechají přeplacenou částku od turisty a naopak, zda se ozvou, pakliže turista zaplatí málo. Jejich výsledky naznačují, že za ponecháním si více peněz pokladními může stát jejich únava, nedbalost či nepozornost. Studie nezjistila signifikantní rozdíl mezi případy nedoplatku, na který pokladní nezareagovali a přeplácenými pokladními, kteří peníze nevrátili. Jediným signifikantním zjištěním studie je, že mužští figuranti byli podváděni méně. Kanadská studie naopak zjistila, že zákazníci-muži jsou pokladními okrádáni častěji a mladší pokladní jsou k nečestnosti nakloněni více než starší zaměstnanci (Gabor, Strean, Singh, & Varis, 1986). Výsledky však nejsou robustní a použitý design neumožňuje odlišit přímé nečestné chování a opomenutí či přehlédnutí.

Naše studie na základě návštěv více než 300 obchodů v Praze ukázala, že podvádění zákazníků pokladními nastává v 14,3 až 20,3 % případů obchodních transakcí a je tedy poměrně rozšířené. Podvádění pokladních přitom v realitě nemusí být firmami rozpoznáno (neexistuje důkaz o přečinu jako třeba inventurní manko při okrádání zaměstnavatele) a rozpoznají-li podvod reálné oběti, nemusí mít důkaz či motivaci na konfrontaci s podvádějícím. Vůči dřívějším studiím můžeme vyloučit, že okrádání zákazníků je především důsledkem nepozornosti pokladních (nicméně vizte Graf 2.). Nepotvrdili jsme přitom, že by se pokladní večer chovali více nečestně než ráno či odpoledne, data spíše naznačují opačnou závislost. Náš experiment je přímým negativním testem pro MME (Kouchaki & Smith, 2014)

a nepřímo pro teorii vyčerpaného ega. Z našich dat nevyplývá, že by v průběhu dne práce či rozhodování vyčerpaly mentální kapacity zaměstnanců natolik, aby večer neměli sílu dodržovat normy správného chování. Náš výsledek zapadá do řady nedávných studií, které vyvrací silnou existenci vyčerpávání ega a ukazují, že se nemusí jednat o reálný fenomén, který by měl být reflektován v business praxi (Carter & McCullough, 2013, 2014; Hagger & Chatzisarantis, 2016; Lurquin et al., 2016); pro teorii potvrzující výsledky pak vizte kupř. (Barnes, Schaubroeck, Huth, & Ghumman, 2011; Gino, et al., 2011).



Graf 2. Rozdělení pokladními odebraných částek, které neodpovídaly ceně, tj. pokladní si vzali méně než byla cena (-) či více než byla cena (+) (v CZK). Případy, kdy došlo k správnému odebrání částky, nejsou zaneseny (231 případů, 76,7 %). Možné chyby dané nepozorností či “zaokrouhlením” od -6 do +7 CZK jsou obarveny černě.

Nezbytnost terénních studií vyplývá i z nereplikovatelnosti mnohých psychologických zjištění. Působení jimi identifikovaných efektů není možné často replikovat ani v laboratorních podmínkách (Open Science Collaboration, 2015). Síla efektu v realitě s řadou dalších situačních a rušivých vlivů je pak nutně ještě slabší. Naše studie je příkladem, že fenomén MME (a nepřímo tak i teorie vyčerpaného ega) nemusí být natolik silný, aby z něj při reálných transakcích vyplývaly jakékoliv sledovatelné důsledky.

2.5 Aplikace poznatků o vlivu fyziologických faktorů na rozhodování manažerů – případ parazitální manipulace

Jak již bylo zmíněno, behaviorální ekonomie využívá i poznatky a metodiky neurověd; na základě fyziologických mechanismů stojících za vnímáním, posuzováním a rozhodováním se snaží predikovat chování lidí v organizační či tržní realitě. V článku/kapitole “Puppet Master: Possible Influence of Parasite *Toxoplasma gondii* on Managers and Employees” (kap. 6.) shrnuji, jak parazit *Toxoplasma gondii* cíleně manipuluje neuronálním a hormonálním systémem svého hostitele. Na základě systematického review pak uzavírám, že *Toxoplasma*-pozitivní lidé mohou mít specifické osobnostní vlastnosti, ve srovnání s neinfikovanou populací, a že tyto rozdíly by mohly být způsobeny fyziologickou manipulací parazitem (i když v některých případech je stále pravděpodobné, že určité skupiny lidí mají vyšší pravděpodobnost získání infekce). *Toxoplasma*-pozitivní jednotlivci mají pomalejší reakce, dají se snadněji rozptýlit od svého úkolu a jejich pracovní paměť je horší. *Toxoplasma* může snižovat životní spokojenost lidí. Nakažení lidé častěji věří, že jejich instinktivní chování při hrozcím nebezpečím je poměrně pomalé a pasivní, a že někteří lidé mají sílu vnutit jim svou vůli. Také věří, že když jsou napadeni, přestanou bojovat, protože jejich vlastní podvědomí je zradí. Infikovaní muži mají vyšší hladinu testosteronu a jejich fyzický vzhled je popisován jako více mužský a dominantní. Toxoplazmóza tak může nabídnout vhodný model pro výzkum vlivu osobnostních rysů a kognitivních schopností na individuální pracovní výkon a na organizační výsledky. V současné době však neexistuje žádná studie, která by specificky zkoumala účinky toxoplazmózy v souvislosti s organizačním prostředím. Článek/kapitola rozvádí, na jaké oblasti by se výzkum manažerských nauk mohl zaměřit.

2.6 Možné aplikace disertační práce ve strategickém řízení firem a v pedagogice

Teorie lokálního myšlení je poměrně prostá, tvrdí, že některé informace jsou za určitých podmínek pro spotřebitele výraznější, čímž nadměrně přitáhnou pozornost k úzké charakteristice zboží, spotřebitel pak podcení další, často podstatnější informace (rozvinuto dále v kap. 4). Tato konceptualizace a empirické studie lze přímo využít v (kurzech) marketingu. Firmy mohou kupř. strategicky využívat omezené a extrémní formy informací: „extrémní ceny jsou často dobrými vábiči pozornosti (kupř. ultra-levné jídlo v restauraci nebo ultra-levné PC v obchodě s počítači). Kompromis, kterému pak čelí firma nabízející řadu produktů, je, že vábič pozornosti bude ztrátový... ale může generovat nepřímé výnosy tím, že přitáhne pozornost spotřebitele k dalším produktům.“ (Eliaz & Spiegler, 2011, str. 260). Aplikální práce však musí stanovit, které pozornost uchvacující opatření fungují, do jaké míry jde o nákladově-výnosově efektivní opatření a u kterých výrobků a kterých segmentů spotřebitelů fungují. Popsané behaviorální chyby na straně spotřebitelů často vedou k neoptimálnímu rozhodování, které firmy dále ziskově prohlubují (Grubb, 2015). I přes literaturu o šťouchání lidí k lepšímu rozhodování (Thaler & Sunstein, 2009), neexistuje mnoho reálných intervencí, které by úspěšně debiasovaly spotřebitele při chování popisovaném v tomto projektu. Přitom i nevýrazný, krátkodobý pozornostní šok dokáže zlepšit neoptimální rozhodování domácností. Kupříkladu účastníci šetření, jejichž otázky byly zaměřeny i na poplatky z přečerpávání účtu, následně ve svém reálném finančním rozhodování vykazovali nižší pravděpodobnost přečerpání účtu (Stango & Zinman, 2014). Poznatky lze tak využít i v kurzech zabývajících se společenskou odpovědností, obchodní etikou či regulací hospodářské soutěže.

Využití teorie lokálního myšlení u manažerů má přímé aplikace v (kurzech) managementu a strategického řízení. Teorie lokálního myšlení koncepčně sjednocuje poznatky, jak manažeři zpracovávají a vyhodnocují informace v nejrůznějších oblastech jejich rozhodování

(rozvinuto dále v kap. 3). Ukazuje, že systematicky přeceňují informace či rizika, která se jim snadněji objevují v mysli – rozhodování, které obvykle vede k negativním důsledkům (vzácně i k pozitivním). Teorie může poskytnout nástroje pro varování, za jakých okolností manažeři mohou podléhat iracionálním tendencím a jak je napravit. Samozřejmě nejde vždy o samospásná řešení, třeba z mechanismů upozornění na reálně důležité informace (jako třeba na výrobní normu) se může lehce vyvinout další zavalení upozorněními, které ztratí jakoukoliv významnost.

Trojúhelník nečestnosti dává inspiraci k nástrojům na omezení nečestného chování, je tak přímo využitelný v kurzech obchodní etiky, řízení lidských zdrojů či forenzní ekonomie či účetnictví. Pakliže lidé nemají příležitost k podvodu, nemohou se jej účastnit (rozvinuto dále v kap. 5). Studie o podvodném navyšování počtu SSRN downloadů vědci ukázala, že pakliže webová stránka zavede mechanismy proti podvodnému stahování, praxe stahování vlastních studií vymizí. Jsou-li lidé vnímáni coby znalí specifické problematiky či existuje možnost, že budou za svá práva více bojovat (jak ukázaly příklady mužů a nižších cen opravy aut či méně chirurgických operací u právníků), jsou podváděni méně. Nabízí se tedy příležitost využít nástroje na snižování informační asymetrie, jako kupříkladu webové stránky porovnávající konkurenční nabízející, opatření organizací na ochranu spotřebitelů zvyšující transparentnost či prostá demonstrace jednotlivce, že o problematice ví (Gneezy, List, & Price, 2012). Podobně, když lidé nebudou mít motivaci podvádět, protože pravděpodobnost odhalení či dopadení bude velká, neetické chování se sníží (Nagin, 2013). Stejně tak, pakliže se lidem znemožní či znesnadní možnosti, jak racionalizovat své neetické chování (Zhang, Gino, & Bazerman, 2014).

2.7 Reference

- Addoum, J. M., Kumar, A., Le, N., & Niessen-Ruenzi, A. (2015). Geographic Proximity and Financial Contagion: Spill-over Effects from Local Bankruptcies. Retrieved from http://www1.villanova.edu/content/dam/villanova/VSB/assets/marc/marc2015/GeoBankruptcy_combined_v05.pdf
- Ariely, D., Garcia-Rada, X., Hornuf, L., & Mann, H. (2014). The (true) legacy of two really existing economic systems. *Munich Discussion Paper*. Retrieved from <http://dx.doi.org/10.2139/ssrn.2457000>
- Asendorpf, J. B., Conner, M., De Fruyt, F., De Houwer, J., Denissen, J. J. A., Fiedler, K., . . . Wicherts, J. M. (2013). Recommendations for Increasing Replicability in Psychology. *European Journal of Personality*, 27(2), 108-119. doi: 10.1002/per.1919
- Baker, M., & Wurgler, J. (2013). Chapter 5 - Behavioral Corporate Finance: An Updated Survey. In M. H. George M. Constantinides & M. S. Rene (Eds.), *Handbook of the Economics of Finance* (Vol. 2, Part A, pp. 357-424). Amsterdam: Elsevier.
- Barfort, S., Harmon, N. A., Hjorth, F. G., & Olsen, A. L. (2015). Dishonesty and Selection into Public Service in Denmark: Who Runs the World's Least Corrupt Public Sector? Available at SSRN 2664983.
- Barkan, R., Ayal, S., & Ariely, D. (2015). Ethical dissonance, justifications, and moral behavior. *Current Opinion in Psychology*, 6, 157-161. doi: 10.1016/j.copsyc.2015.08.001
- Barnes, C. M., Schaubroeck, J., Huth, M., & Ghumman, S. (2011). Lack of sleep and unethical conduct. *Organizational Behavior and Human Decision Processes*, 115(2), 169-180. doi: 10.1016/j.obhdp.2011.01.009
- Bateson, M., Nettle, D., & Roberts, G. (2006). Cues of being watched enhance cooperation in a real-world setting. *Biology Letters*, 2(3), 412-414.
- Bazerman, M. H., & Gino, F. (2012). Behavioral Ethics: Toward a Deeper Understanding of Moral Judgment and Dishonesty. *Annual Review of Law and Social Science*, 8(1), 85-104. doi: 10.1146/annurev-lawsocsci-102811-173815
- Bedeian, A. G., Taylor, S. G., & Miller, A. N. (2010). Management Science on the Credibility Bubble: Cardinal Sins and Various Misdemeanors. *Academy of Management Learning & Education*, 9(4), 715-725.
- Bergh, D., Sharp, B., & Li, M. (2016). Tests for identifying "red flags" in empirical findings: Demonstration and recommendations for authors, reviewers and editors. *Academy of Management Learning & Education*. doi: 10.5465/amle.2015.0406
- Bettis, R. A. (2012). The search for asterisks: Compromised statistical tests and flawed theories. *Strategic Management Journal*, 33(1), 108-113. doi: 10.1002/smj.975

- Bettis, R. A., Helfat, C. E., & Shaver, J. M. (2016). The necessity, logic, and forms of replication. *Strategic Management Journal*. doi: 10.1002/smj.2580
- Bjørnskov, C. (2007). Determinants of generalized trust: A cross-country comparison. *Public Choice*, 130(1), 1-21. doi: 10.1007/s11127-006-9069-1
- Bloodgood, J. M., Turnley, W. H., & Mudrack, P. (2008). The Influence of Ethics Instruction, Religiosity, and Intelligence on Cheating Behavior. *Journal of Business Ethics*, 82(3), 557-571. doi: 10.1007/s10551-007-9576-0
- Bones, A. K. (2012). We Knew the Future All Along: Scientific Hypothesizing is Much More Accurate Than Other Forms of Precognition—A Satire in One Part. *Perspectives on Psychological Science*, 7(3), 307-309. doi: 10.1177/1745691612441216
- Broockman, D., Kalla, J., Aronow, P. (2015). Irregularities in LaCour (2014); http://stanford.edu/~dbroock/broockman_kalla_aronow_lg_irregularities.pdf
- Browne, M., Knoller, C., & Richter, A. (2015). Behavioral Bias and The Demand for Bicycle and Flood Insurance. *Journal of Risk and Uncertainty*, 50(2), 141-160. doi: 10.1007/s11166-015-9212-9
- Bryan, C. J., Adams, G. S., & Monin, B. (2013). When cheating would make you a cheater: Implicating the self prevents unethical behavior. *Journal of Experimental Psychology: General*, 142(4), 1001.
- Busse, M. R., Pope, D. G., Pope, J. C., & Silva-Risso, J. (2015). The Psychological Effect of Weather on Car Purchases. *The Quarterly Journal of Economics*, 130(1), 371-414. doi: 10.1093/qje/qju033
- Byington, E., & Felps, W. (2016). Solutions to the credibility crisis in management science. *Academy of Management Learning & Education*. doi: 10.5465/amle.2015.0035
- Camerer, C. F., & Malmendier, U. (2007). Behavioral Economics of Organization. In P. Diamond & H. Vartiainen (Eds.), *Behavioral Economics and Its Applications* (pp. 235-290). Princeton: Princeton University Press.
- Camerer, C. F., & Weber, R. (2013). Experimental organizational economics. In R. Gibbons & J. Roberts (Eds.), *The Handbook of Organizational Economics* (pp. 213-262). Princeton: Princeton University Press.
- Carter, E. C., & McCullough, M. E. (2013). Is ego depletion too incredible? Evidence for the overestimation of the depletion effect. *Behavioral and Brain Sciences*, 36(6), 683-684. doi: 10.1017/S0140525X13000952
- Carter, E. C., & McCullough, M. E. (2014). Publication bias and the limited strength model of self-control: has the evidence for ego depletion been overestimated? *Frontiers in Psychology*, 5(823). doi: 10.3389/fpsyg.2014.00823
- Cheung, I., Campbell, L., LeBel, E.,... Houdek, P.,... & Yong, J. C. (2016). Registered replication report: Study 1 from Finkel, Rusbult, Kumashiro, & Hannon (2002).

- Perspectives on Psychological Science*, 11(5), 750-764. doi: 10.1177/1745691616664694
- DellaVigna, S. (2009). Psychology and Economics: Evidence from the Field. *Journal of Economic Literature*, 47(2), 315-372. doi: 10.1257/jel.47.2.315
- Dessaint, O., & Matray, A. (2014). Do managers overreact to salient risks? Evidence from hurricane strikes. *Available at SSRN 2358186*. Retrieved from http://www.cbs.dk/files/cbs.dk/olivierdessaintpaper_1.pdf
- Devinney, T. M., & Siegel, D. S. (2012). Perspectives on the Art and Science of Management Scholarship. *The Academy of Management Perspectives*, 26(1), 6-11. doi: 10.5465/amp.2012.0001
- Dinh, J. E., & Lord, R. G. (2013). Current Trends in Moral Research: What We Know and Where to Go From Here. *Current Directions in Psychological Science*, 22(5), 380-385. doi: 10.1177/0963721413486147
- Doyen, S., Klein, O., Pichon, C.-L., & Cleeremans, A. (2012). Behavioral Priming: It's All in the Mind, but Whose Mind? *PLoS ONE*, 7(1), e29081. doi: 10.1371/journal.pone.0029081
- Eliasz, K., & Spiegler, R. (2011). Consideration Sets and Competitive Marketing. *The Review of Economic Studies*, 78(1), 235-262. doi: 10.1093/restud/rdq016
- Englmaier, F., Roider, A., & Sunde, U. (2014). The Role of Communication of Performance Schemes: Evidence from a Field Experiment. *Discussion Paper Series*. Retrieved from <http://epub.ub.uni-muenchen.de/24879/1/507.pdf>
- Evanschitzky, H., Baumgarth, C., Hubbard, R., & Armstrong, J. S. (2007). Replication research's disturbing trend. *Journal of Business Research*, 60(4), 411-415. doi: 10.1016/j.jbusres.2006.12.003
- Fanelli, D. (2012). Negative results are disappearing from most disciplines and countries. *Scientometrics*, 90(3), 891-904. doi: 10.1007/s11192-011-0494-7
- Feldman, R. E. (1968). Response to compatriot and foreigner who seek assistance. *Journal of Personality and Social Psychology*, 10(3), 202-214.
- Ferguson, C. J., & Heene, M. (2012). A Vast Graveyard of Undead Theories: Publication Bias and Psychological Science's Aversion to the Null. *Perspectives on Psychological Science*, 7(6), 555-561. doi: 10.1177/1745691612459059
- Fischbacher, U., & Föllmi-Heusi, F. (2013). Lies in disguise—an experimental study on cheating. *Journal of the European Economic Association*, 11(3), 525-547. doi: 10.1111/jeea.12014
- Francis, G. (2012). Too good to be true: Publication bias in two prominent studies from experimental psychology. *Psychonomic Bulletin & Review*, 19(2), 151-156. doi: 10.3758/s13423-012-0227-9

- Friesen, L., & Gangadharan, L. (2012). Individual level evidence of dishonesty and the gender effect. *Economics Letters*, 117(3), 624-626. doi: 10.1016/j.econlet.2012.08.005
- Gabor, T., Streat, J., Singh, G., & Varis, D. (1986). Public deviance: An experimental study. *Canadian Journal of Criminology*, 28, 17-29.
- Gallagher, J. (2014). Learning about an Infrequent Event: Evidence from Flood Insurance Take-Up in the United States. *American Economic Journal: Applied Economics*, 6(3), 206-233. doi: 10.1257/app.6.3.206
- Gelman, A. (2015). The Connection Between Varying Treatment Effects and the Crisis of Unreplicable Research: A Bayesian Perspective. *Journal of Management*, 41(2), 632-643. doi: 10.1177/0149206314525208
- Gneezy, U., List, J., & Price, M. K. (2012). Toward an Understanding of Why People Discriminate: Evidence from a Series of Natural Field Experiments. *National Bureau of Economic Research Working Paper Series*, No. 17855.
- Giluk, T. L., & Postlethwaite, B. E. (2015). Big Five personality and academic dishonesty: A meta-analytic review. *Personality and Individual Differences*, 72, 59-67.
- Gino, F., & Ariely, D. (2012). The dark side of creativity: Original thinkers can be more dishonest. *Journal of Personality and Social Psychology*, 102(3), 445-459. doi: 10.1037/a0026406
- Gino, F., Schweitzer, M. E., Mead, N. L., & Ariely, D. (2011). Unable to resist temptation: How self-control depletion promotes unethical behavior. *Organizational Behavior and Human Decision Processes*, 115(2), 191-203. doi: 10.1016/j.obhdp.2011.03.001
- Grubb, M. D. (2015a). Behavioral Consumers in Industrial Organization: An Overview. *Review of Industrial Organization*, 47(3), 247-258. doi: 10.1007/s11151-015-9477-9
- Grubb, M. D. (2015b). Failing to Choose the Best Price: Theory, Evidence, and Policy. *Review of Industrial Organization*, 47(3), 303-340. doi: 10.1007/s11151-015-9476-x
- Hagger, M. S., & Chatzisarantis, N. L. D. (2016). A Multilab Preregistered Replication of the Ego-Depletion Effect. *Perspectives on Psychological Science*, 11(4), 546-573. doi: 10.1177/1745691616652873
- Hambrick, D. C. (2007). The Field of Management's Devotion to Theory: Too Much of a Good Thing? *Academy of Management Journal*, 50(6), 1346-1352. doi: 10.5465/amj.2007.28166119
- Hanna, R., & Wang, S.-Y. (2013). Dishonesty and Selection into Public Service. *National Bureau of Economic Research Working Paper Series*, No. 19649.

- Harrison, J. S., Banks, G. C., Pollack, J. M., O'Boyle, E. H., & Short, J. (2014). Publication Bias in Strategic Management Research. *Journal of Management*. doi: 10.1177/0149206314535438
- Hayek, F. A. v. (1988). *Fatal Conceit, The Errors of Socialism* (Vol. 1). Chicago: University of Chicago Press.
- Hayek, F. A. v. (1995). *Kontrarevoluce vědy. Studie o zneužívání rozumu*. Praha: Liberální institut.
- Hendrick, C. (1990). Replications, strict replications, and conceptual replications: Are they important? *Journal of Social Behavior & Personality*, 5(4), 41-49.
- Houdek, P. (2008). Časové preference z pohledu kognitivní neurovědy. *E-Logos, Electronic Journal for Philosophy*, 15(2008), ISSN 1211-0442.
- Houdek, P. (2016). A Perspective on Consumers 3.0: They Are Not Better Decision-Makers than Previous Generations. *Frontiers in Psychology*, 7(848). doi: 10.3389/fpsyg.2016.00848
- Houdek, P., & Koblůvský, P. (2016). Behavioural Finance and Organisations: A Review. *Acta Oeconomica Pragensia*, 2016(2), 33-45. doi: 10.18267/j.aop.527
- Houdek, P., & Koblůvský, P. (in press). Behavioral economics of organization: employees and managers. *E+M Ekonomie a management*.
- Hrabak, M., Vujaklija, A., Vodopivec, I., Hren, D., Marušić, M., & Marušić, A. (2004). Academic misconduct among medical students in a post-communist country. *Medical Education*, 38(3), 276-285. doi: 10.1111/j.1365-2923.2004.01766.x
- Hubbard, R., & Armstrong, J. S. (1994). Replications and extensions in marketing: Rarely published but quite contrary. *International Journal of Research in Marketing*, 11(3), 233-248. doi: 10.1016/0167-8116(94)90003-5
- Hubbard, R., & Vetter, D. E. (1996). An empirical comparison of published replication research in accounting, economics, finance, management, and marketing. *Journal of Business Research*, 35(2), 153-164. doi: 10.1016/0148-2963(95)00084-4
- Hubbard, R., Vetter, D. E., & Little, E. L. (1998). Replication in strategic management: scientific testing for validity, generalizability, and usefulness. *Strategic Management Journal*, 19(3), 243-254. doi: 10.1002/(SICI)1097-0266(199803)19:3<243::AID-SMJ951>3.0.CO;2-0
- Chiou, W.-B., & Cheng, Y.-Y. (2013). In broad daylight, we trust in God! Brightness, the salience of morality, and ethical behavior. *Journal of Environmental Psychology*, 36, 37-42. doi: 10.1016/j.jenvp.2013.07.005
- Ioannidis, J. P. A. (2011). An Epidemic of False Claims. *Scientific American*, 304(6), 16-16.

- John, L. K., Loewenstein, G., & Prelec, D. (2012). Measuring the Prevalence of Questionable Research Practices With Incentives for Truth Telling. *Psychological Science*, 23(5), 524-532. doi: 10.1177/0956797611430953
- Kacmar, K. M., & Whitfield, J. M. (2000). An Additional Rating Method for Journal Articles in the Field of Management. *Organizational Research Methods*, 3(4), 392-406. doi: 10.1177/109442810034005
- Kepes, S., Bennett, A. A., & McDaniel, M. A. (2014). Evidence-Based Management and the Trustworthiness of Our Cumulative Scientific Knowledge: Implications for Teaching, Research, and Practice. *Academy of Management Learning & Education*, 13(3), 446-466. doi: 10.5465/amle.2013.0193
- Kerr, N. L. (1998). HARKing: Hypothesizing After the Results are Known. *Personality and Social Psychology Review*, 2(3), 196-217. doi: 10.1207/s15327957pspr0203_4
- Kish-Gephart, J. J., Harrison, D. A., & Treviño, L. K. (2010). Bad apples, bad cases, and bad barrels: Meta-analytic evidence about sources of unethical decisions at work. *Journal of Applied Psychology*, 95(1), 1-31. doi: 10.1037/a0017103
- Kouchaki, M., & Smith, I. H. (2014). The Morning Morality Effect: The Influence of Time of Day on Unethical Behavior. *Psychological Science*, 25(1), 95-102. doi: 10.1177/0956797613498099
- Kuběna, A. A., Houdek, P., Lindová, J., Příplatová, L., & Flegr, J. (2014). Justine Effect: Punishment of the Unduly Self-Sacrificing Cooperative Individuals. *PLoS ONE*, 9(3), e92336. doi: 10.1371/journal.pone.0092336
- Laibson, D., & List, J. A. (2015). Principles of (Behavioral) Economics. *American Economic Review*, 105(5), 385-390. doi: 10.1257/aer.p20151047
- LaCour, M. J., & Green, D. P. (2014). When contact changes minds: An experiment on transmission of support for gay equality. *Science*, 346(6215), 1366-1369. doi: 10.1126/science.1256151 [RETRACTED]
- Leung, K. (2011). Presenting Post Hoc Hypotheses as A Priori: Ethical and Theoretical Issues. *Management and Organization Review*, 7(3), 471-479. doi: 10.1111/j.1740-8784.2011.00222.x
- Lurquin, J. H., Michaelson, L. E., Barker, J. E., Gustavson, D. E., von Bastian, C. C., Carruth, N. P., & Miyake, A. (2016). No Evidence of the Ego-Depletion Effect across Task Characteristics and Individual Differences: A Pre-Registered Study. *PLoS ONE*, 11(2), e0147770. doi: 10.1371/journal.pone.0147770
- Mas, A., & Moretti, E. (2009). Peers at Work. *The American Economic Review*, 99(1), 112-145.
- Mazar, N., Amir, O., & Ariely, D. (2008). The dishonesty of honest people: A theory of self-concept maintenance. *Journal of marketing research*, 45(6), 633-644.

- Meehl, P. E. (1978). Theoretical risks and tabular asterisks: Sir Karl, Sir Ronald, and the slow progress of soft psychology. *Journal of Consulting and Clinical Psychology*, 46(4), 806-834. doi: 10.1037/0022-006X.46.4.806
- Miller, D., Hartwick, J., & Le Breton-Miller, I. (2004). How to detect a management fad—and distinguish it from a classic. *Business Horizons*, 47(4), 7-16. doi: 10.1016/S0007-6813(04)00043-6
- Moore, C., & Gino, F. (2013). Ethically adrift: How others pull our moral compass from true North, and how we can fix it. *Research in Organizational Behavior*, 33, 53-77. doi: 10.1016/j.riob.2013.08.001
- Muehlheusser, G., Roider, A., & Wallmeier, N. (2015). Gender differences in honesty: Groups versus individuals. *Economics Letters*, 128(0), 25-29. doi: 10.1016/j.econlet.2014.12.019
- Nagin, D. S. (2013). Deterrence: A Review of the Evidence by a Criminologist for Economists. *Annual Review of Economics*, 5(1), 83-105. doi: 10.1146/annurev-economics-072412-131310
- Nuijten, M. B., Hartgerink, C. H. J., van Assen, M. A. L. M., Epskamp, S., & Wicherts, J. M. (2015). The prevalence of statistical reporting errors in psychology (1985–2013). *Behavior Research Methods*, 1-22. doi: 10.3758/s13428-015-0664-2
- O'Boyle, E. H., Banks, G. C., & Gonzalez-Mulé, E. (2014). The Chrysalis Effect: How Ugly Initial Results Metamorphosize Into Beautiful Articles. *Journal of Management*. doi: 10.1177/0149206314527133
- Open Science Collaboration (2015). Estimating the reproducibility of psychological science. *Science*, 349(6251), 943. doi: 10.1126/science.aac4716
- Pashler, H., & Harris, C. R. (2012). Is the Replicability Crisis Overblown? Three Arguments Examined. *Perspectives on Psychological Science*, 7(6), 531-536. doi: 10.1177/1745691612463401
- Peters, T., & Waterman, R. (1982). *In search of excellence*. New York: Harper & Row.
- Pfeffer, J., & Sutton, R. I. (2006). *Hard facts, dangerous half-truths, and total nonsense: Profiting from evidence-based management*. Boston: Harvard Business Press.
- Pierce, L., & Balasubramanian, P. (2015). Behavioral field evidence on psychological and social factors in dishonesty and misconduct. *Current Opinion in Psychology*, 6, 70-76. doi: 10.1016/j.copsyc.2015.04.002
- Rabin, M. (1998). Psychology and economics. *Journal of Economic Literature*, 36(1), 11-46.
- Rabinowitz, F. E., Colmar, C., Elgie, D., Hale, D., Niss, S., Sharp, B., & Sinclitico, J. (1993). Dishonesty, Indifference, or Carelessness in Souvenir Shop Transactions. *The Journal of Social Psychology*, 133(1), 73-79. doi: 10.1080/00224545.1993.9712120

- Rohrer, D., Pashler, H., & Harris, C. R. (2015). Do subtle reminders of money change people's political views? *Journal of Experimental Psychology: General*, 144(4), e73-e85. doi: 10.1037/xge0000058
- Ruffle, B. J., & Tobol, Y. (2016). Clever enough to tell the truth. *Experimental Economics*, 1-26. doi: 10.1007/s10683-016-9479-y
- Shalvi, S., Gino, F., Barkan, R., & Ayal, S. (2015). Self-Serving Justifications: Doing Wrong and Feeling Moral. *Current Directions in Psychological Science*, 24(2), 125-130. doi: 10.1177/0963721414553264
- Shu, L. L., Mazar, N., Gino, F., Ariely, D., & Bazerman, M. H. (2012). Signing at the beginning makes ethics salient and decreases dishonest self-reports in comparison to signing at the end. *Proceedings of the National Academy of Sciences*, 109(38), 15197-15200. doi: 10.1073/pnas.1209746109
- Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-Positive Psychology: Undisclosed Flexibility in Data Collection and Analysis Allows Presenting Anything as Significant. *Psychological Science*, 22(11), 1359-1366. doi: 10.1177/0956797611417632
- Singh, K., Ang, S. H., & Leong, S. M. (2003). Increasing Replication for Knowledge Accumulation in Strategy Research. *Journal of Management*, 29(4), 533-549. doi: 10.1016/s0149-2063_03_00024-2
- Stango, V., & Zinman, J. (2014). Limited and Varying Consumer Attention: Evidence from Shocks to the Salience of Bank Overdraft Fees. *Review of Financial Studies*, 27(4), 990-1030. doi: 10.1093/rfs/hhu008
- Stroebe, W., Postmes, T., & Spears, R. (2012). Scientific Misconduct and the Myth of Self-Correction in Science. *Perspectives on Psychological Science*, 7(6), 670-688. doi: 10.1177/1745691612460687
- Thaler, R. H., & Sunstein, C. R. (2009). *Nudge: Improving decisions about health, wealth, and happiness*. London: Penguin Books.
- Torsello, D., & Venard, B. (2016). The Anthropology of Corruption. *Journal of Management Inquiry*, 25(1), 34-54. doi: 10.1177/1056492615579081
- Treviño, L. K., Weaver, G. R., & Reynolds, S. J. (2006). Behavioral Ethics in Organizations: A Review. *Journal of Management*, 32(6), 951-990. doi: 10.1177/0149206306294258
- Tsang, E. W. K., & Kwan, K.-m. (1999). Replication and Theory Development in Organizational Science: A Critical Realist Perspective. *Academy of Management Review*, 24(4), 759-780. doi: 10.5465/amr.1999.2553252
- Vohs, K. D., Baumeister, R. F., Schmeichel, B. J., Twenge, J. M., Nelson, N. M., & Tice, D. M. (2014). Making choices impairs subsequent self-control: A limited-resource account of decision making, self-regulation, and active initiative. *Motivation Science*, 1(S), 19-42. doi: 10.1037/2333-8113.1.S.19

- Watkins, M. J. (1990). Mediationism and the obfuscation of memory. *American Psychologist*, 45(3), 328-335. doi: 10.1037/0003-066x.45.3.328
- Wicherts, J. M., Borsboom, D., Kats, J., & Molenaar, D. (2006). The poor availability of psychological research data for reanalysis. *American Psychologist*, 61(7), 726-728. doi: 10.1037/0003-066x.61.7.726
- Williams, K. M., Nathanson, C., & Paulhus, D. L. (2010). Identifying and profiling scholastic cheaters: Their personality, cognitive ability, and motivation. *Journal of Experimental Psychology: Applied*, 16(3), 293-307. doi: 10.1037/a0020773
- Wolfe, D. T., & Hermanson, D. R. (2004). The fraud diamond: Considering the four elements of fraud. *The CPA Journal*, 74(12), 38-42.
- Zitzewitz, E. (2012). Forensic economics. *Journal of Economic Literature*, 50(3), 731-769. doi: 10.1257/jel.50.3.731
- Zhang, T., Gino, F., & Bazerman, M. H. (2014). Morality rebooted: Exploring simple fixes to our moral bugs. *Research in Organizational Behavior*, 34, 63-79. doi: 10.1016/j.riob.2014.10.002

3. What Comes to a Manager's Mind: Theory of Local Thinking

Abstract

This article develops a model of local thinking in managerial decision making. According to the concept, attention is drawn by selectively salient factors or recalls in specific decision-making contexts. Although decision makers are aware of the changing conditions, they do not make a sufficient mental correction for the fact that the relevance of these factors is not generalized. They overestimate the importance of an option that “easily comes to one’s mind”: They excessively extrapolate from their experiences and extreme news, succumb to reference points and imprinting. The usefulness of the concept of local thinking in explaining decisions taken by managers is demonstrated by a short conceptual review of several empirical studies on local economic and natural shocks, negotiation of bank loans, expert forecasts, workers’ compensations, and gender equality. The conclusion brings speculations about further implications of the theory for organizational research.

Keywords

behavioral theory, individual/CEO decision making, organizational behavior, personality, affect/emotions

3.1 Introduction

If a hurricane passes an area where a firm is located, the firm will begin to accumulate short-term liquidity (Dessaint & Matray, 2014). If the frequency of bankruptcies is growing, corporate managers from various sectors in a 100-km radius surrounding the bankrupt firm start reducing investment and indebtedness levels (Addoum, Kumar, Le, & Niessen-Ruenzi, 2015). Once a manager is reminded about the piece rate for workers on his team, the team's productivity will increase (Englmaier, Roider, & Sunde, 2014).

Not a single one of these examples is surprising, although they should be. The locations of hurricanes are governed by a long-term stationary distribution, so the arrival of a hurricane bears no new information about the location of the next arrival. Bankruptcies in an area could indicate a shock to the local economy, but the financial strategy of firms a little farther than 100 km away has been unchanged—a conservative financial strategy cannot be explained by a local business cycle, because economic conditions surely exert influence over more than a 100 km. Finally, managers already know the piece rate, as they had worked for several years under it and this incentive pay constitutes a substantial fraction of their income, so a reminder of the rate should no longer boost their motivation.

The above-mentioned cases are caused by the disproportional influence of temporary salient pieces of information. That is why managers overestimate liquidity or financial risk or intensively perceive a production goal (as I will explain in detail later). Their choice is made on the basis of a characteristic that has been attracting their attention in a particular decision-making context. There is abundant psychological evidence that describes similar behavior as the availability heuristic: the tendency not to process information using the Bayesian approach, but to overestimate information that effortlessly comes to one's mind due to its vividness or immediacy (Tversky & Kahneman, 1973, 1974). Daniel Kahneman (2011)

illustrated the heuristic as follows: “A salient event that attracts your attention will be easily retrieved from memory. Divorces among Hollywood celebrities and sex scandals among politicians attract much attention, and instances will come easily to mind. You are therefore likely to exaggerate the frequency of both Hollywood divorces and political sex scandals.” (p. 130).

Nevertheless, the supporting evidence from judgment and decision-making research (or from behavioral sciences in general) is often based on laboratory experiments or surveys; methods, which could have a number of drawbacks (Camerer & Weber, 2013; Levitt & List, 2007) or as Surroca, Prior, and Tribó Giné (2016) put it: “Interviews may suffer from problems of reliability and replicability, it is difficult to capture past cognitions by means of surveys, and case studies do not necessarily represent broader populations. Moreover, although surveys have proved useful in measuring cognitions, their cross-sectional nature makes it difficult to perform dynamic analyses.” (p. 2).

There is indeed evidence that the sizes of many published psychological effects are much weaker and psychology research suffers with other problems of reproducibility (Open Science Collaboration, 2015). Although field studies sometimes corroborate laboratory research, they usually relate to consumer decisions (DellaVigna, 2009; Grubb, 2015; Houdek & Koblovský, 2015). Furthermore, criticism of some organizational researchers warns that not all psychological phenomena are so robust that they could be identified on a managerial or organizational level, “a key question . . . is whether biases will survive in an organizational arena that naturally includes a variety of checks and balances” (Staw, 2010, p. 413; see also Foss, 2003).

Nonetheless, as demonstrated by the examples in the introduction of this article, there are a small but growing number of empirical studies and nonlaboratory field studies using real

firms' data that are focused on the prevalence of decision-making biases in organizational environments. They commonly confirm the influence of heuristics or cognitive frames in managerial judgment (Baker & Wurgler, 2013; Loock & Hinnen, 2015; Moore & Flynn, 2008), especially under the perspective of limited attention (Ocasio, 2011).

However, behavioral research is often criticized as a nontheoretical summary of cognitive errors and heuristics, often contradictory and with crucial contextual information removed (Gigerenzer, 2000, 2008; Gigerenzer & Gaissmaier, 2011; Porac & Tschang, 2013).

This article takes the challenge and introduces an integrative concept of local thinking based on the cognitive frames approach (Hodgkinson & Healey, 2008). "Through cognitive frames, managers reduce complexity and ambiguity by selectively organizing and interpreting signals from the organizational context . . . structure and content of a particular cognitive frame lead to a particular interpretation of a situation and, in turn, to a particular managerial response." (Hahn, Preuss, Pinkse, & Figge, 2014, p. 465).

The concept uses research about availability heuristics, psychological theories of salience, and selective recall, and it was already successfully formalized in economics for consumer choice in a series of articles as a model of local thinking (Bordalo, Gennaioli, & Shleifer, 2012, 2013, 2015; Gennaioli & Shleifer, 2010).

The model of managerial local thinking could conceptualize several aspects of how managers process information and make sense of risk and ambiguity, as well as how they make risk-free choices. The approach offers prolific inspiration for management research and specific caveats for practice, for example, identifying in situ what circumstances could lead to irrational decision making. In the following section, I sketch a theory of managerial local thinking. The subsequent three sections concern overreactions by managers to some information that easily comes to their minds, that is, extreme news, primary and strong

personal experiences, and their (biased) expectations. The conclusion brings speculations about further implications of the theory for organizational research and mentions caveats to the theory as well.

3.2 Theory of Managerial Local Thinking

Local thinking means assessing a situation in which one's attention is skewed by salient factors in the decision-making context; to put it simply, "people focus their attention on some but not all aspects of the world" (Bordalo et al., 2012, pp. 1279-1280). Attributes or features of a decision-making problem could be given disproportional weight for external or internal reasons and attention is further allocated to those salient attributes of choice.

The external reasons concern new information themselves—their form and content. For example, (a) extreme and/or recent information (Dessaint & Matray, 2014) as well as (b) information contrasting with existing expectations are more salient. These reference expectations could purely result from the status quo or could be biased in varying degrees by selective recall (Bordalo et al., 2015) and attention (Bordalo et al., 2012, 2013). Moreover, certainly, there could be rational forward-looking expectations.

On the other hand, internal reasons originate in personalities and personal histories of decision makers: (c) Specific strong personal experiences could create a general tendency for perceiving and evaluating all information (Dahl, Dezső, & Ross, 2011; Malmendier, Tate, & Yan, 2011) and (d) primary work-related experiences could influence even unrelated present decisions in organizations (Law, 2013; Marquis & Tilcsik, 2013).

The focus of a decision maker is attracted to the most dissimilar characteristic of choice in contrast to the expectations, or to the characteristic, which he or she strongly recalls or is reminded of (either by natural arrival of a situation or by salient reminder). The significance

of this information is overrated, even though it may no longer be relevant to the current decision-making process. Other, more relevant information may fail to be recalled and/or considered. A specific cognitive frame occurs or is chosen and it then guides an individual's attention toward its specific attributes of a choice.

Although people may be aware of changing conditions and/or of their goals, they do not make a mental correction for the proper level of importance and relevance of the salient factors and for the fact that further relevant factors and diverse future circumstances may exist. It is no coincidence that the Central Intelligence Agency (CIA) in its field manual for organizational sabotage advises saboteurs to have focused the attention of colleagues to possible negative consequences of their decisions. Nothing ruins the ability to make a decision as much as the salient fear of a mistake. Advocate “caution.” Be “reasonable” and urge your [colleagues] to be “reasonable” and avoid haste which might result in embarrassments or difficulties later on . . . Be worried about the propriety of any decision—raise the question of whether such action as is contemplated lies within the jurisdiction of the group or whether it might conflict with the policy of some higher echelon. (CIA, 1944 [unclassified 2008], p. 28)

The mechanism of selective attention causes reference-dependent choices, because the same characteristics will be perceived at a different intensity in varying situations. For example, by making some people aware of different pay rates, a study (Bracha, Gneezy, & Loewenstein, 2015) found out that lower paid individuals supplied less work than when they were unaware of the higher pay rates. Or if wages are increased unexpectedly during a job, the rise is more salient and therefore it has a greater impact on the workers' productivity than if the wages were increased by the same amount at the beginning of the job (Gilchrist, Luca, & Malhotra, 2014; Ockenfels, Sliwka, & Werner, 2015). Higher saliency of unexpected wage increase had

another positive effect. The latter field experiment shows that workers were more honest and were more willing to do voluntary work after a surprising wage increase.

Evaluation of a job seeker could be dependent on the performance of the job seeker before him or her. The well-known effect of a decoy could be explained in the same way (Tversky & Simonson, 1993): It is possible to affect the choice between two dominant alternatives when a third inferior alternative is added, depending on which one of the dominant alternatives is more similar to the inferior alternative—the contrast between the inferior and its closest dominant alternative makes this dominant alternative a better option by salience; the effect of the decoy is observed in the recruitment process as well (Highhouse, 1996).

Context-sensitive decision making leads to errors in prediction due to the mechanisms of selective attention and projection bias. As stated above, selective attention means that a salient factor at a given moment catches the attention of decision makers and then occupies their minds. Salient circumstances, attributes, or information receive disproportionately greater weight in a particular judgment and people make biased predictions of future conditions based on them. They extrapolate from current salient attributes directly or with an inadequate adjustment (Loewenstein, O'Donoghue, & Rabin, 2003), or they have an incorrect prediction of their future preferences with correctly estimated future circumstances (Gilbert & Wilson, 2007). They do not (adequately) consider or do not remember other important aspects of the choice that did not readily come to mind.

3.3 Overestimation of Risks and Underestimation of Incentives

It is not possible to measure the focus of attention or expectations of managers by using real firms' data. That is why related hypotheses are tested, that is, the assumption that certain cognitive styles occur and that they have a steady influence on the studied behavior, about which there are firms' data. In managerial practice, selective attention to certain risk factors

could lead to an overestimation of frequency or importance of these risks and could sidetrack a firm's risk management, and of course, vice versa, the selective attention to potential business opportunities can tarnish consideration of their potential risks.

As shown by Dessaint and Matray (2014) in their article regarding the arrival of hurricanes, managers raise cash holding (a form of corporate general insurance) when the sudden *salience* of liquidity risk occurs due to the hurricane passing through the nearby area, although there had been no indication that the objective risk of a natural or business disaster is greater than before. During the 12 months after the hurricane, firms with headquarters in nearby areas of the impact of the hurricane increased their cash holdings by 0.84 percentage points of their total assets on average, compared with firms that were farther away (for whom the hurricane had not been so salient). The increase to the cash holding is short-term only (less than a year) and then returns to its original level, as the salience of the last hurricane fades. Corporate managers without any previous experience with hurricanes and managers of small and young companies, that is, less experienced ones, suffer more. Dessaint and Matray present a similar finding in the case of earthquakes. Managers of U.S. companies based in the areas where earthquakes are frequent react with the same detention of liquidity when a strong earthquake occurs somewhere in the world (outside the United States). The reactions of companies are clearly not caused by regional economic problems connected to a natural disaster, but rather by overestimating the salient risks in the managers' minds. Dessaint and Matray also prove that this behavior reduces the value of the company for shareholders.

Local bankruptcy acts similar to a hurricane in a neighboring region. The study of Addoum et al. (2015) using a sample of 1,883 bankruptcies from 1986 to 2006 showed that companies geographically close to a bankruptcy reduce their investment expenditures and debt. The effect is stronger when the CEO is dismissed from the bankrupt company and when its board

members are also members of nonbankrupt companies. Direct personal experience with the bankruptcy of a board member's company increases the salience of bankruptcy for other managers. Addoum et al. confirmed that the choice of a conservative financial strategy is an overreaction of managers to the reminder of the possibility of bankruptcy and it is not a rational response by bankruptcy-threatened companies. Another explanation of this phenomenon could be that companies have difficult access to resources on the financial and banking market due to the increase in local creditors' risks.

In both examples, managers were surprised by the occurrence of a business risk, which they had forgotten or underestimated, and overreact to this salient information by implementing nonoptimal conservative finance strategy.

For a case of a reminder of piece rate, the logic is already apparent (Englmaier et al., 2014). The study used an agricultural company and lettuce picking, teamwork in which each team member has allocated tasks and the manager oversees the daily picking norm regarding the quality and quantity of lettuce. The manager determines the speed of the harvest machine, the matching of workers to tasks, the training of incoming workers, and so on. Even when managers are motivated to meet the piece rate, they are preoccupied with other duties, which is why this goal may not come to their attention. In the controlled experiment, the piece rate note for random selected teams was posted at the harvest machine, that is, was made salient for them. These teams later attained roughly a 4% increase in productivity and daily manager's remuneration increased by the same level (although there was also a nonsignificant reduction of quality of production). The study notes that although it could be expected that certain crucial factors should always be considered, in fact they are not. The significance of priorities may simply fade away and managers forget about them (or the information about

them is being processed slowly; Hirshleifer & Teoh, 2003). In these cases, a reminder is an effective tool to improve the decision-making process.

3.4 Significant Changes in Relation to the Status Quo Reference

Distinctive characteristics do not manifest only in extreme events. People most often compare alternatives against the status quo and worse expected alternatives are obviously most salient and nobody is overly willing to accept them, even when conditions of a deal have changed substantively. Reference expectations thus naturally gravitate to status quo (of course, this is not always the case; Köszegi & Rabin, 2006, 2007). Dougal, Engelberg, Parsons, and Van Wesep (2015) demonstrated that historically acquired loan rates affect the current conditions of the loan in this manner. Although historical data should not affect the current capital costs of the project (it depends on the expected cash flow), companies which had obtained low rate bank loan due to the favorable market conditions in the past receive lower rates again, even if the loan interest moves higher, compared with companies which had received a loan when rates were higher (with comparable credit ratings, loan type, etc.). Rather than the expected risk, a significant reference point in the past (an anchor) is the basis for the negotiations about the new conditions for bank loans.

The existence of mental anchors was demonstrated also by Baker, Pan, and Wurgler (2012) in the case of negotiations about mergers and acquisitions. The behavior of both parties is disproportionately dependent on historical peaks (salient points) in the prices of shares, 52 week, 39 week, and others. Shareholders of the buyer firm are responding to the purchase price near the peak with displeasure, because they see the premium as overpaying. Conversely, the probability of acceptance from the selling company will increase if the offered price is higher than the 52-week maximum. These patterns explain why the frequency of mergers and acquisitions correlates with the movement of stock exchange indexes. Both

parties will reach an agreement more easily when markets are growing, because the buying price is closer to the recent peak. As shown, even in high-stakes negotiations, salient reference points from the past matter, although they should not play a significant role in influencing the decision making of senior managers; see also Kristensen and Gärling (1997).

Similarly, in their field study, Tanjim Hossain and John List (2012) found that if workers at a Chinese manufacturing facility were expecting “losses” in their conditional bonus incentives, they increased productivity more than if they were expecting possible “gains” (in loss schema, employees were provisionally given the bonus before the work begins, but were notified that if the production does not reach a certain threshold, it will be retracted; in gain schema, employees were notified that if production reaches a certain threshold, a bonus will be paid). The prospect of losing an earned bonus is an unusual, salient method of remuneration, and in addition, it exploits loss aversion, a tendency to prefer avoiding losses to getting gains, as has been noted already by Adam Smith (1759/2002): “Pain . . . is, in almost all cases, a more pungent sensation than the opposite and correspondent pleasure. The one, almost always, depresses us much more below the ordinary, or what may be called the natural state of our happiness, than the other ever raises us above it.” (p. 141).

Both of the factors have the power to occupy the mind of workers deeply and, consequently, greater productivity follows. Nevertheless, very high performance-contingent bonus could have a detrimental effect on job performance because potential loss of a big bonus can cause choking under pressure (Ariely, Gneezy, Loewenstein, & Mazar, 2009; for more examples, see Camerer & Malmendier, 2007).

3.5 Strong and Primary Personal Experience

There are not only salient endogenous incidents in a person’s mind but also significant incidents from one’s personal history. As described by Gilbert and Wilson (2007), “It seems

that everyone remembers his/her best day and his/her worst day and yesterday” (p. 1353). It is understandable that when managers have their own strong experience, for example, with a deep recession, they are more conscious with credit and business risks, which is because the risks of bankruptcy can easily arise in their mind. Managers who were growing (Malmendier et al., 2011) or managers who started working (Schoar & Zuo, 2011) during depressions have indeed a higher aversion to debt and they use internal financing more. Bernile, Bhagwat, and Rau (2015) found more comprehensive, inverse U-shaped relation between a CEO’s early-life exposure to disasters and corporate risk taking, i.e. results showing that experiencing disasters without extreme consequences rather desensitizes CEOs to the negative consequences of risk.

It can also be expected that the early-career exposure to an organization’s culture, mentors, and peers imprint in individuals specific hard-boiled types of behaviors, attitudes, and knowledge (Azoulay, Liu, & Stuart, 2009; Vranka & Houdek, 2015). For instance, financial analysts who had worked with more optimistic coworkers in their early career are more optimistic in their subsequent careers; they issue stronger buy recommendations, higher earnings forecasts, and higher price targets (Law, 2013). The persistence of (quite) nonvariable behavioral styles despite subsequent environmental changes supports the concept of imprinting in an organizational decision-making process, which complements the theory of local thinking (Marquis & Tilcsik, 2013).

Specific personal or family relationships can also bring attention to specific aspects of a problem. Daughters could make women’s issues more salient to fathers, and fathers may adopt more feminist attitudes and behavior. Indeed, judges who have daughters are more pro-feminist than judges without daughters in cases that explicitly involved employment discrimination on the basis of gender by private actors, employment discrimination on the basis of pregnancy by private actors, reproductive rights or abortion, and claims made under

Title IX (Glynn & Sen, 2015). Similarly, Dahl et al. (2011) found that the birth of a first daughter to a CEO resulted in a 1.4% increase in women's wages (more than double the increase experienced by male employees), and an approximately 0.8% decrease in the gender wage gap. If the first daughter was also a first child, female employees experienced a 3.2% increase in wages, an effect more than 6 times larger than the one for male employees.

3.6 Conclusion

The theory of local managerial thinking conceptually integrates knowledge of how managers evaluate and process information in various areas of their decisions. It shows that managers systematically overestimate salient information or risks that come easily to their minds. These cognitive frames usually lead to negative consequences (and in some cases positive ones). The theory and documented evidence can provide tools for caution by pointing out that managers can be influenced by unconscious propensities, under what circumstances these irrational tendencies could prevail, and how to fix them (Mahoney & Sanchez, 2004; Soll, Milkman, & Payne, 2015). Of course, it will not always be a panacea solution. For example, frequent reminders of important and momentarily nonsalient information can quickly become useless warnings that will lose any significance or quickly create attention poverty in managers' minds.

Because saliency causes, by definition, narrow thinking, it is always advisable for a manager to look at a decision at hand from a different perspective. Narrow thinking could be significantly reduced by forcing people to consider the other possible outcomes of a choice (Haran, Moore, & Morewedge, 2010). It is also possible to reduce a person's biased beliefs simply by averaging his or her assessment of a situation with a forced second one that exploits his or her different knowledge (Herzog & Hertwig, 2009; Vul & Pashler, 2008). An organization should maintain a corporate culture where a manager meaningfully considers

arguments against reasons for some proposed course of action and/or where multiple individuals deal with important decisions from different perspectives (Kerr & Tindale, 2004). “One possibility is to appoint a ‘chief naysayer’ whose job is to play devil’s advocate, punching holes in proposals before the company commits to them” (Paredes, 2004, p. 681). Another response to shortcomings in decision making could be in placing greater accountability on managers (Lerner & Tetlock, 1999). Suitable conceptual solution can be an implementation of high reliability organization, an organizational design facilitating the discovery of (behavioral) anomalies (Weick, Sutcliffe, & Obstfeld, 2008). Organizational mindfulness creates cognitive infrastructure that reveals unexpected threats to a company and proposes corrections before risks can escalate out of control.

The theory of local managerial thinking can also be used as a behavioral model to explain wider economic phenomena such as the emergence of managerial fads, whether those are leadership techniques or economic cycles. It was shown that financial fraud and shady reporting are spreading among geographically close companies (DeFond, Francis, & Hu, 2008; Parsons, Sulaeman, & Titman, 2014; as well as the fear of bankruptcy, as noted above), and the same may occur with other practices—not necessarily unfair—such as styles of motivation and compensation of employees and other aspects of corporate culture. Overoptimism of managers can be explained as a focus on the advantages and positive differences in their companies and projects. If there are currently good economic conditions and business outcomes, people make optimistic expectations and overestimate the likelihood of future positive results. Conversely, if there are significant negative circumstances, people overestimate the likelihood of future negative outcomes, they are pessimistic and are excessively risk-averse. These reactions can skew the expectations of executives (CEO, CFO) on future sales growth and thus influence the activity of company investments and investment-economic cycle (Shleifer, Gennaioli, & Ma, 2015).

The take home message of this article is rather simple—information in particular conditions could become easily salient relative to what is normal, disproportionately draw managers’ attention, and cause negligence of important alternative information. But I hardly touched on the possible applications of the local thinking concept in management and organizational research. Future studies should focus on its implication in business ethics, leadership, entrepreneurship, strategic management, team-level performance, and so on (Artinger, Petersen, Gigerenzer, & Weibler, 2015; Flynn & Staw, 2004; Juster & Preston, 2014; Welsh, Ordóñez, Snyder, & Christian, 2015).

There are, of course, various caveats to the concept as well. In particular, all information requires a certain threshold of exposure to come to the front of one’s mind, a challenge for further research is to determine under what circumstances exactly (external ones as well as decision maker’s preferences, history, personality characteristics, etc.) the information exceeds a given threshold and become an “attention-grabbing” attribute of a choice.

A vast majority of referenced studies use data from the United States and are singular findings, it is not yet clear to what extent the results are generalizable to other cultural and legal contexts. It is necessary to replicate these findings in other environments.

3.7 References

- Addoum, J. M., Kumar, A., Le, N., & Niessen-Ruenzi, A. (2015). *Geographic proximity and financial contagion: Spill-over effects from local bankruptcies*. Retrieved from http://www1.villanova.edu/content/dam/villanova/VSB/assets/marc/marc2015/GeoBankruptcy_combined_v05.pdf
- Ariely, D., Gneezy, U., Loewenstein, G., & Mazar, N. (2009). Large stakes and big mistakes. *The Review of Economic Studies*, 76, 451-469. doi:10.1111/j.1467-937X.2009.00534.x
- Artinger, F., Petersen, M., Gigerenzer, G., & Weibler, J. (2015). Heuristics as adaptive decision strategies in management. *Journal of Organizational Behavior*, 36(S1), S33-S52. doi:10.1002/job.1950
- Azoulay, P., Liu, C., & Stuart, T. (2009). *Social influence given (partially) deliberate matching: Career imprints in the creation of academic entrepreneurs* (Harvard Business School Entrepreneurial Management working paper). Retrieved from [http://www.hbs.edu/faculty/Publication Files/09-136.pdf](http://www.hbs.edu/faculty/Publication%20Files/09-136.pdf)
- Baker, M., Pan, X., & Wurgler, J. (2012). The effect of reference point prices on mergers and acquisitions. *Journal of Financial Economics*, 106, 49-71. doi:10.1016/j.jfineco.2012.04.010
- Baker, M., & Wurgler, J. (2013). Behavioral corporate finance: An updated survey. In M. H. George, M. Constantinides, & M. S. Rene (Eds.), *Handbook of the economics of finance* (Vol. 2, Pt. A, pp. 357-424). Amsterdam, The Netherlands: Elsevier.
- Bernile, G., Bhagwat, V., & Rau, P. R. (2015). *What doesn't kill you will only make you more risk-loving: Early-life disasters and CEO behavior*. Retrieved from http://papers.ssrn.com/sol3/Papers.cfm?abstract_id=2423044
- Bordalo, P., Gennaioli, N., & Shleifer, A. (2012). Salience theory of choice under risk. *The Quarterly Journal of Economics*, 127, 1243-1285. doi:10.1093/qje/qjs018
- Bordalo, P., Gennaioli, N., & Shleifer, A. (2013). Salience and consumer choice. *Journal of Political Economy*, 121, 803-843. doi:10.1086/673885
- Bordalo, P., Gennaioli, N., & Shleifer, A. (2015). *Memory, attention and choice*. Retrieved from http://scholar.harvard.edu/files/shleifer/files/evokedsets_march18_0.pdf
- Bracha, A., Gneezy, U., & Loewenstein, G. (2015). Relative pay and labor supply. *Journal of Labor Economics*, 33, 297-315. doi:10.1086/678494
- Camerer, C. F., & Malmendier, U. (2007). Behavioral economics of organization. In P. Diamond & H. Vartiainen (Eds.), *Behavioral economics and its applications* (pp. 235-290). Princeton, NJ: Princeton University Press.

Camerer, C. F., & Weber, R. (2013). Experimental organizational economics. In R. Gibbons & J. Roberts (Eds.), *The handbook of organizational economics* (pp. 213-262). Princeton, NJ: Princeton University Press.

Central Intelligence Agency. (1944 [unclassified 2008]). *Simple sabotage* (Field manual). Retrieved from <https://www.cia.gov/news-information/featured-story-archive/2012-featured-story-archive/simple-sabotage.html>

Dahl, M. S., Dezső, C. L., & Ross, D. G. (2011). *Like daughter, like father: How women's wages change when CEOs have daughters*. Retrieved from <http://www.batz.ch/wp-content/uploads/DaughtersofCEOs.pdf>

DeFond, M. L., Francis, J. R., & Hu, X. (2008). *The geography of auditor independence and sec enforcement*. Retrieved from <http://www.ssrn.com/abstract=1132885>

DellaVigna, S. (2009). Psychology and economics: Evidence from the field. *Journal of Economic Literature*, 47, 315-372. doi:10.1257/jel.47.2.315

Dessaint, O., & Matray, A. (2014). *Do managers overreact to salient risks? Evidence from hurricane strikes*. Retrieved from http://www.cbs.dk/files/cbs.dk/olivierdessaintpaper_1.pdf

Dougal, C., Engelberg, J., Parsons, C. A., & Van Wesep, E. D. (2015). Anchoring on credit spreads. *The Journal of Finance*, 70, 1039-1080. doi:10.1111/jofi.12248

Englmaier, F., Roider, A., & Sunde, U. (2014). *The role of communication of performance schemes: Evidence from a field experiment* (Discussion paper series). Retrieved from <http://epub.ub.uni-muenchen.de/24879/1/507.pdf>

Flynn, F. J., & Staw, B. M. (2004). Lend me your wallets: The effect of charismatic leadership on external support for an organization. *Strategic Management Journal*, 25, 309-330. doi:10.1002/smj.377

Foss, N. J. (2003). Bounded rationality in the economics of organization: "Much cited and little used." *Journal of Economic Psychology*, 24, 245-264. doi:10.1016/S0167-4870(02)00206-4

Gennaioli, N., & Shleifer, A. (2010). What comes to mind. *The Quarterly Journal of Economics*, 125, 1399-1433. doi:10.1162/qjec.2010.125.4.1399

Gigerenzer, G. (2000). *Adaptive thinking: Rationality in the real world*. New York, NY: Oxford University Press.

Gigerenzer, G. (2008). Why heuristics work. *Perspectives on Psychological Science*, 3, 20-29. doi:10.1111/j.1745-6916.2008.00058.x

Gigerenzer, G., & Gaissmaier, W. (2011). Heuristic decision making. *Annual Review of Psychology*, 62, 451-482. doi:10.1146/annurev-psych-120709-145346

- Gilbert, D. T., & Wilson, T. D. (2007). Prospection: Experiencing the future. *Science*, 317, 1351-1354. doi:10.1126/science.1144161
- Gilchrist, D. S., Luca, M., & Malhotra, D. K. (2014). *When $3 + 1 > 4$: Gift structure and reciprocity in the field* (Harvard Business School NOM Unit working paper). Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2331487
- Glynn, A. N., & Sen, M. (2015). Identifying judicial empathy: Does having daughters cause judges to rule for women's issues? *American Journal of Political Science*, 59, 37-54. doi:10.1111/ajps.12118
- Grubb, M. (2015). Failing to choose the best price: Theory, evidence, and policy. *Review of Industrial Organization*, 47, 303-340. doi:10.1007/s11151-015-9476-x
- Hahn, T., Preuss, L., Pinkse, J., & Figge, F. (2014). Cognitive frames in corporate sustainability: Managerial sensemaking with paradoxical and business case frames. *Academy of Management Review*, 39, 463-487. doi:10.5465/amr.2012.0341
- Haran, U., Moore, D. A., & Morewedge, C. K. (2010). A simple remedy for overprecision in judgment. *Judgment and Decision Making*, 5, 467-476.
- Herzog, S. M., & Hertwig, R. (2009). The wisdom of many in one mind: Improving individual judgments with dialectical bootstrapping. *Psychological Science*, 20, 231-237. doi:10.1111/j.1467-9280.2009.02271.x
- Highhouse, S. (1996). Context-dependent selection: The effects of decoy and phantom job candidates. *Organizational Behavior and Human Decision Processes*, 65, 68-76. doi:10.1006/obhd.1996.0006
- Hirshleifer, D., & Teoh, S. H. (2003). Limited attention, information disclosure, and financial reporting. *Journal of Accounting & Economics*, 36, 337-386. doi:10.1016/j.jacceco.2003.10.002
- Hodgkinson, G. P., & Healey, M. P. (2008). Cognition in organizations. *Annual Review of Psychology*, 59, 387-417. doi:10.1146/annurev.psych.59.103006.093612
- Hossain, T., & List, J. A. (2012). The behavioralist visits the factory: Increasing productivity using simple framing manipulations. *Management Science*, 58, 2151-2167. doi:10.1287/mnsc.1120.1544
- Houdek, P., & Koblovský, P. (2015). Where is my money? New findings in fiscal psychology. *Society*, 52, 155-158. doi:10.1007/s12115-015-9873-7
- Juster, T., & Preston, A. (2014). *Do star performers produce more stars? Peer effects and learning in elite teams* (NBER working paper). Retrieved from <http://www.nber.org/papers/w20478>
- Kahneman, D. (2011). *Thinking, fast and slow*. London, England: Penguin Books.

- Kerr, N. L., & Tindale, R. S. (2004). Group performance and decision making. *Annual Review of Psychology*, 55, 623-655. doi:10.1146/annurev.psych.55.090902.142009
- Köszegi, B., & Rabin, M. (2006). A model of reference-dependent preferences. *The Quarterly Journal of Economics*, 121, 1133-1165. doi:10.1093/qje/121.4.1133
- Köszegi, B., & Rabin, M. (2007). Reference-dependent risk attitudes. *The American Economic Review*, 97, 1047-1073. doi:10.1257/aer.97.4.1047
- Kristensen, H., & Gärling, T. (1997). The effects of anchor points and reference points on negotiation process and outcome. *Organizational Behavior and Human Decision Processes*, 71, 85-94. doi:10.1006/obhd.1997.2713
- Law, K. (2013). *Career imprinting: The influence of coworkers in early career*. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1972352
- Lerner, J. S., & Tetlock, P. E. (1999). Accounting for the effects of accountability. *Psychological Bulletin*, 125, 255-275. doi:10.1037/0033-2909.125.2.255
- Levitt, S. D., & List, J. A. (2007). What do laboratory experiments measuring social preferences reveal about the real world? *Journal of Economic Perspectives*, 21, 153-174. doi:10.1257/jep.21.2.153
- Loewenstein, G., O'Donoghue, T., & Rabin, M. (2003). Projection bias in predicting future utility. *The Quarterly Journal of Economics*, 118, 1209-1248. doi:10.1162/003355503322552784
- Looock, M., & Hinnen, G. (2015). Heuristics in organizations: A review and a research agenda. *Journal of Business Research*, 68, 2027-2036. doi:10.1016/j.jbusres.2015.02.016
- Mahoney, J. T., & Sanchez, R. (2004). Building new management theory by integrating processes and products of thought. *Journal of Management Inquiry*, 13, 34-47. doi:10.1177/1056492603260658
- Malmendier, U., Tate, G., & Yan, J. O. N. (2011). Overconfidence and early-life experiences: The effect of managerial traits on corporate financial policies. *The Journal of Finance*, 66, 1687-1733. doi:10.1111/j.1540-6261.2011.01685.x
- Marquis, C., & Tilcsik, A. (2013). Imprinting: Toward a multilevel theory. *The Academy of Management Annals*, 7, 195-245. doi:10.1080/19416520.2013.766076
- Moore, D. A., & Flynn, F. J. (2008). The case for behavioral decision research in organizational behavior. *The Academy of Management Annals*, 2, 399-431. doi:10.1080/19416520802211636
- Ocasio, W. (2011). Attention to attention. *Organization Science*, 22, 1286-1296. doi:10.1287/orsc.1100.0602

- Ockenfels, A., Sliwka, D., & Werner, P. (2015). Timing of kindness—Evidence from a field experiment. *Journal of Economic Behavior & Organization*, 111, 79-87. doi:10.1016/j.jebo.2014.12.003
- Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science*, 349, 943. doi:10.1126/science.aac4716
- Paredes, T. A. (2004). Too much pay, too much deference: Behavioral corporate finance, CEOs, and corporate governance. *Florida State University Law Review*, 32, 673-762.
- Parsons, C. A., Sulaeman, J., & Titman, S. (2014). *The geography of financial misconduct* (NBER working paper). Retrieved from <http://www.nber.org/papers/w20347>
- Porac, J., & Tschang, F. T. (2013). Unbounding the managerial mind: It's time to abandon the image of managers as "small brains." *Journal of Management Inquiry*, 22, 250-254. doi:10.1177/1056492613476223
- Schoar, A., & Zuo, L. (2011). *Shaped by booms and busts: How the economy impacts CEO careers and management styles* (NBER working paper). Retrieved from <http://www.nber.org/papers/w17590>
- Shleifer, A., Gennaioli, N., & Ma, Y. (2015). *Expectations and investment* (NBER working paper). Retrieved from <http://www.nber.org/chapters/c13589.pdf>
- Smith, A. (2002). *The theory of moral sentiments*. Cambridge, UK: Cambridge University Press. (Original work published 1759)
- Soll, J. B., Milkman, K. L., & Payne, J. W. (2015). A user's guide to debiasing. In G. Keren & G. Wu (Eds.), *The Wiley Blackwell handbook of judgment and decision making* (pp. 924-950). Chichester, UK: Wiley-Blackwell.
- Staw, B. M. (2010). The trouble with JDM: Some limitations to the influence of JDM on organizational research. *Industrial and Organizational Psychology*, 3, 411-416. doi:10.1111/j.1754-9434.2010.01260.x
- Surroca, J., Prior, D., & Tribó Giné, J. A. (2016). Using panel data DEA to measure CEOs' focus of attention: An application to the study of cognitive group membership and performance. *Strategic Management Journal*, 37, 370-388. doi:10.1002/smj.2350
- Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, 5, 207-232. doi:10.1016/0010-0285(73)90033-9
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185, 1124-1131.
- Tversky, A., & Simonson, I. (1993). Context-dependent preferences. *Management Science*, 39, 1179-1189. doi:10.1287/mnsc.39.10.1179

Vranka, M. A., & Houdek, P. (2015). Many faces of bankers' identity: How (not) to study dishonesty. *Frontiers in Psychology*, 6, Article 302. doi:10.3389/fpsyg.2015.00302

Vul, E., & Pashler, H. (2008). Measuring the crowd within: Probabilistic representations within individuals. *Psychological Science*, 19, 645-647. doi:10.1111/j.1467-9280.2008.02136.x

Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2008). Organizing for high reliability: Processes of collective mindfulness. In A. Boin (Ed.), *Crisis management* (Vol. 3, pp. 81-123). London, England: SAGE.

Welsh, D. T., Ordóñez, L. D., Snyder, D. G., & Christian, M. S. (2015). The slippery slope: How small ethical transgressions pave the way for larger future transgressions. *Journal of Applied Psychology*, 100, 114-127. doi:10.1037/a0036950

4. A Perspective on Consumers 3.0: They Are Not Better Decision-Makers Than Previous Generations

Abstract

This perspective article builds upon the theory of local thinking in interpretation and prediction of consumer behavior in a contemporary world of information overload. It is shown that even informed and socially and environmentally responsible consumers (consumers 3.0) exhibit selective recall, limited attention and bounded search in the perception and interpretation of price and quality of purchases. Their decisions fall into local cognitive frames, which specifically focus attention only on a narrow structure and content of the choice. The cognitive frames can be established by recent or regular purchases, but also extreme or primary purchase experiences. The article includes a short conceptual review of car, food, clothing, insurance, drugs, paintings and other product purchases showing that the local cognitive frames often lead to bad bargains across various sectors. The article presents several suggestions for future research.

Keywords

anchoring, decision-making biases, cognitive frames, consumer 3.0, limited attention, local thinking

4.1 Introduction

The aim of this perspective article is to show that even in age of an informed and socially and environmentally responsible consumer (consumer 3.0), his/her style of decision-making has not changed much. People still tend to overrate the importance of the information that is vivid, emotional, recent or frequent and therefore easily appears in their minds, as Tversky and Kahneman famously wrote: “It is a common experience that the subjective probability of traffic accidents rises temporarily when one sees a car overturned by the side of the road.” (1974, p. 1127). The immediate experience creates a specific cognitive frame under which people interpret further information. In an insurance choice consumers thus prefer insurance for a high probability, low consequence risks and downplay insurance for a low probability, high consequence risks (Browne, Knoller, & Richter, 2015), or that insurance take-up spikes the year after a catastrophe and then steadily declines as salience of the event fades off (Gallagher, 2014). Consumers are framed by immediate weather to buy goods with advantageous attributes in that particular weather, underestimating different future circumstances or changes in their preferences, followed by high returns rates (Busse, Pope, Pope, & Silva-Risso, 2015; Conlin, O'Donoghue, & Vogelsang, 2007). Examples of other cognitive frameworks are abundant.

This article elaborates the concept of cognitive frames in consumer research to offer a simple unifying framework of the forces influencing consumer decisions in contemporary complex consumer environment (see also Olshavsky, & Granbois 2002; Uncles, Ehrenberg, & Hammond, 2002; Foxall, 2010). I utilize a behavioral theory about consumers' local thinking that has been conceptualized in a series of articles by Bordalo, Gennaioli, and Shleifer (2012, 2013, 2015) and Gennaioli and Shleifer (2010) and is itself inspired by a model of selective recall (Kahneman, & Miller, 1986). This approach offers a fruitful conceptualization of consumer decision-making across the retail sector.

The article follows by showing that consumers do not consider all relevant information when shopping. Their behavior is better described by selective recall, limited attention, and bounded search. In the third section a theory of consumer local thinking is introduced. When demonstrating its relevance, I particularly refer to contemporary studies about consumer behavior in market settings to avoid criticism of laboratory and/or survey research. Although laboratory-based studies have proved useful in measuring many aspects of shopping cognition and behavior, they may suffer from problems of low external validity and non-replicability, their participants do not necessarily represent broader populations, and it is generally difficult to capture highly dynamic and incentivized aspects of markets in a lab (Open Science Collaboration, 2015; Henrich, Heine, & Norenzayan, 2010; Hertwig & Ortmann, 2001).

4.2 Limited search and attention

The cognitive frames approach of consumer decision-making is interlinked with the findings that consumers' willingness (or capability) to seek out new information, their attention and memory are not limitless (DellaVigna, 2009; Iyengar & Kamenica, 2010; Houdek & Koblovský, 2015) and consumers may not realize these aspects of their bounded rationality (but there is a great heterogeneity in consumers' shopping sophistication). Moreover, the natural reaction of firms to bounded rationality of some consumers is to make their price policies more complex and less transparent to further hamper consumers' ability to compare products (Carlin, 2009; Hortaçsu & Syverson, 2004). In many market conditions there is no reason to expect that competition among firms will push to greater price transparency, e.g. if median consumers focus only on a base price and ignore shrouded add-ons, then firms with transparent pricing lose to non-transparent firms (Gabaix & Laibson, 2006).

Consumers focus only on a small fraction of products. An average consumer is deciding between two to five cars while 160 brands of them exist; when there are flooding coffee

options consumers are making a decision only between three and four alternatives – essentially regardless of the range of possible substitutes, a consumer takes into account always only a few units of alternatives (Hauser & Wernerfelt, 1990). The advent of internet search engines and comparative sites dramatically increased opportunities to choose the best deals by allowing consumers to engage in low-cost price comparisons (Brown & Goolsbee, 2002; Zettelmeyer, Morton, & Silva-Risso, 2006), nevertheless the prices on the internet are far from converging to the law of one price.

The amount of time spent on shopping (including browsing and buying) has not changed at all in more than 30 years (Ott, 2011). Consumers are still affected by the most salient sales (Grubb, 2015). Additionally, “advances in search technology are accompanied by investments by firms in obfuscation” (Ellison & Ellison, 2009, p. 427). Ellison and Ellison show that charging a low price for a low-quality product on a price comparison website actually increases retailer’s sales of medium- and high-quality products on the retailer’s own website. Consumers are influenced by the salient (top) positions of low-quality product on comparison website, they move to retailer own website, where they are persuaded to buy a higher-quality higher-price product instead (see Chioveanu & Zhou, 2013, and Spiegler, 2014).

Moreover, complex pricing policies and (perceived) quality differences of many product categories do not always allow direct comparison (Greenleaf, Johnson, Morwitz, & Shalev, 2016). Consumers must rely on limited search and are thus heavily influenced by various levels of information disclosure (Brown, Hossain, & Morgan, 2010) and/or advertising, which exacerbate their confusion. Consumers’ take-up of credit card offers responds much less to the interest rate on credit cards than to a photo of an attractive woman in a mailing marketing campaign (Bertrand, Karlan, Mullainathan, Shafir, & Zinman, 2010). Consumers are willing to pay high premium for branded product, which is homogeneous to non-branded alternatives.

In their case study of headache remedies Bronnenberg, Dubé, Gentzkow, and Shapiro (2015) found that more informed consumers (such as physicians and pharmacists) choose national brands over store brands only 9 percent of the time, compared to 26 percent of the time for the average consumer.

Consumers pay attention largely to digits that are on the left in a string of numbers. The left-digit bias creates a salient break-point, which is why items priced at .99 or 3.99 dollars are considered much better deals than items priced at 1.00 or 4.00 dollars. The bias is not governing only trivial purchases. At American used-car market Lacetera, Pope, and Sydnor (2012) found that vehicles with odometer values between 79,900 and 79,999 miles were sold on average for approximately two hundred dollars more than cars with odometer values between 80,000 and 80,100 miles, but for only ten dollars less than cars with odometer values between 79,800 and 79,899. Such focal points could be found in a number of consumer choices. Scott and Yelowitz (2010) detected that prospective grooms are willing to pay premiums upward of 18% for an engagement ring's diamond that is one-half carat rather than slightly less than a half carat and between 5% and 10% for a one-carat rather than a slightly less than one-carat stone.

When price promotions occur, many consumers fail to switch to purchasing a package that has the lowest unit price, which suggests a lack of price awareness. In their study on quantity surcharges Clerides and Courty (2015) showed a decrease of only 27% in the sales of disadvantageous large laundry detergents relative to the sales the week preceding the surcharge. In the utilities sector, households rarely search for alternative retailers, and when they do search, the current retailer has a significant brand advantage (Hortaçsu, Madanizadeh, & Puller, 2015). Nevertheless, real-time feedback on quantity of electricity consumed via an in-home display could have a substantial impact on price elasticity of households (Jessoe &

Rapson, 2014). The advent of technology using big data about consumption could lead to higher price and quality transparency. It could be expected that consumers' sensitivity to price and quality features of products will grow.

4.3 Consumers' local cognitive frames

Cognitive frames create simplified mental models of choices. They constrain how consumers respond to stimuli by selectively organizing information from the consumers' environment and by focusing attention only on a narrow structure and content of the perceived attributes of a choice. They thus create specific expectations about a product's price or consumption quality (Bordalo et al., 2013, 2015; Gennaioli & Shleifer, 2010). For example, a classic study by Hoyer (1984) found that while choosing a laundry detergent, consumers examine on average only 1.4 packages and only 11 percent of them look at more than two. Hoyer concluded that 91 percent of the consumers were governed by a simple, one-statement reason for their choice (e.g. "I like it" tactics). Surprisingly, systematic work about which choice rules consumers use in various shopping contexts is largely missing.

The expectations about prominent attributes of a product, or consideration sets (Roberts & Lattin, 1997; Houdek, 2016), are at the top of a consumer's mind and they lead to a particular interpretation of a choice at hand and affect the alternatives consumers consider (Tversky, Sattath, & Slovic, 1988). Other aspects of the choice are reflected or recalled only partially or not at all. This neglect makes consumers leave out better products from their consideration sets.

The expectations (cognitive frames) can be created by (i) deeply remembered psychological states – strong personal or primary experiences could create a general tendency for evaluating all following products and create a long lasting consumption pattern (see sec. 2.3.1). They are further formed by (ii) recalls from immediate past or from frequent consumption (sec. 2.3.2);

the more often or saliently consumers were experiencing some attribute of choice, the stronger cognitive frame of this choice they then apply. The expectations could originate from (iii) transient mood and affects (sec. 2.3.3) or just in other words (iv) they can be created by momentarily salient external circumstances; typically, from information supplied by marketing devices or projections of current tastes influenced by immediate context to the future (sec. 2.3.4). Moreover, an attribute of choice options that is different from the expectations is most salient and the consumer overrates it in their decision-making.

4.3.1 Strong and primary memories, attribution error

Expectations could be derived from primary and/or extreme experiences that consumers more easily recall from memory. The most apparent display of this influence is the loyalty of a consumer to a brand, which originates along with feelings of a satisfactory purchase (Chaudhuri & Holbrook, 2001). The customer is then attracted to the brand because of the trust, nostalgia, familiarity or resistance to change. The favorite brand is prominent in the consumer's mind in a purchase, and other brands may not be considered relevant (Smith & Brynjolfsson, 2001). Past consumption thus strongly impacts the current one and preference of a certain brand can persist in the long term (Bronnenberg, Dubé, & Gentzkow, 2012).

In the same way some kinds of consumption can influence a consumer's satisfaction even long after the purchase had been made. Memories of it influence the consumer, either positively or negatively, in the following decisions, as they bring an emotional context of the previous purchase into the current decision-making, leading to attribution error. For instance, honeymoon, holiday or recreation can steer the long-term choices where to go to a new holiday and how to spend it, because the pleasant nostalgia or conversely strong regret will be very prominent in the consumer's mind. As Uri Simonson noted: “[F]oods tasted for the first time on an empty stomach are remembered as more enjoyable and might hence be disproportionately likely to be purchased again.” (2010, p. 272).

Strong primary experiences can produce a similarly strong impact. Children learn consumer behavioral patterns and preferences from their parents, either by direct imitation or shared preferences (Viswanathan, Childers, & Moore, 2000). Primary experience can impact car purchases: there is a strong correlation between the brand of cars purchased by parents and their children, even after controlling for shared demographic or geographic characteristics (Anderson et al., 2014). This correlation is strongest for cars purchased at the time when the children had still lived together with their parents. Anderson et al.'s findings mean that prices of cars for young families can be lower, as the car company creates loyalty in a future generation of customers. Most other studies about inter-generational preference transfer concerns food (Birch, 1999), but research into this phenomenon in other kinds of goods is virtually nonexistent.

4.3.2 Immediate and frequent consumption, anchoring bias

People are anchored by their immediate or repeated past consumption and/or experience (Simonson & Tversky, 1992). A study (Simonsohn & Loewenstein, 2006) showed that families moving from areas with high rent into cheaper areas spend more on their rent and rent larger homes on average. In contrast, families moving from cheaper into more expensive areas tend to spend less and live in smaller homes (both findings are robust after controlling for the effects of wealth, taste for expensive housing, or mis-estimation of local housing costs etc.). Even after moving, the families were still influenced by their past in their decision about how much they would spend on rent. A similar effect has been found in commuting time; the longer one had commuted in their previous home, the longer they commute in their new location as well (Simonsohn, 2006).

The same anchoring effect, where assessment of a choice is influenced by recent contextually relevant experience, can be found in a number of other situations. Paintings previously sold on “hot” markets for high prices usually continue achieving higher prices in auctions than

comparable paintings previously sold in “cold” markets (Beggs & Graddy, 2009). Sellers of houses bought on a growing market, currently facing nominal loss due to unfavorable market situation, keep their houses on the market for a longer time and higher asking price, and eventually sell them for a higher price than sellers who had initially bought comparable houses for lower prices (Genesove & Mayer, 2001). Consumers' willingness for a purchase can also be affected by completely irrelevant anchors present at the moment of a decision about a purchase (Ariely, Loewenstein, & Prelec, 2003), however, also see Maniadis, Tufano, & List (2014) for the criticism of these findings. However, there are not many studies about the dynamics of anchor updating or about particular shopping features, which could (or couldn't) sway consumers to succumb to an anchor.

4.3.3 Situational influences, emotion and mood, affect bias

The cognitive frames could be derived from external circumstances and internal psychological states that specifically enhance certain attributes of the product and attract attention to it. As mentioned in the introduction, people prefer insurance against events that come to their mind more easily, not necessarily against events that might have a significant impact on their wellbeing (Browne et al., 2015; Gallagher, 2014)

The local consumer thinking approach can build upon the research of the influence of affect and mood on consumer decision-making (Cohen, Pham, & Andrade, 2008). People under different emotional states interpret information differently, exhibit different preferences and salient memories, creating specific cognitive frames influencing their behavior (Schwarz, 2000). Consumers' decision-making is in tow of emotion and visceral factors such as satisfaction, hunger, fear or exhaustion.

Weather changes are often used as a research tool of the impacts of mood on consumer behavior: during sunny weather, people are happier, while in cloudy conditions, their mood is

lower. Restaurants receive worse ratings in rainy weather or heat waves (Bakhshi, Kanuparth, & Gilbert, 2014), sunny weather correlates with higher tips (Rind, 1996) and higher willingness to shop using one's mobile phone (Reinaker, Cheng, & Luo, 2015). Results concerning the impact of mood on consumer decision-making show the importance of situational influences on the consumers' mood (Cohen et al., 2008). There is currently a number of mobile apps tracking or triggering emotional changes, be they weather or social apps (Kramer, Guillory, & Hancock, 2014). They offer new research opportunities for a more detailed identification of the influence of emotional framing in online or mobile shopping.

4.3.4 Situational influences and projection error

Another example of cognitive frame is that consumers tend to exaggerate the degree to which their future tastes will resemble their current tastes, i.e. they are projecting their current tastes influenced by immediate context to the future, decision-making known as projection bias (Loewenstein et al., 2003). Using catalog orders of cold-weather items Conlin et al. (2007) find that consumers are over-influenced by current weather. If the order-date temperature declines by 30 degrees Fahrenheit, the return probability increases by 3.95 percent. Weather had moved in a direction that made the item more valuable and/or salient at the time the consumers had been buying, but these biased valuations did not have to hold the same in the future; as a result, the likelihood of returning the item increased. Projection bias affects advance sales for an outdoor movie theater the same way (Buchheim & Kolaska, forthcoming). Another example is a study by Gorn, Goldberg, & Basu (1993) demonstrating that in evaluation of a speaker system, customers are influenced by the music currently playing on it.

Projection bias does not emerge only in relatively small value purchases. Days that are warmer and skies that are clearer than seasonal averages influence customers to buy more

convertibles. On the contrary, snowstorms increase the sales of cars with four-wheel drive (Busse et al., 2015).

4.4 Conclusion

The theory of consumer local thinking is fairly simple. It states that some information is more salient for the consumers under certain circumstances, drawing disproportional attention to a narrow characteristic of the goods and making even sophisticated and responsible consumers underestimate other, often more relevant information. Future research must specifically identify which attention-drawing measures (i.e. economic, social and/or environmental sustainability) work, how cost-effective they are and for what kinds of products and customers they work best.

The consumers' behavioral biases often lead to bad bargains, further exploited by firms to their profit (Grubb, 2015). Despite a body of literature on nudging people towards better decision-making (Thaler & Sunstein, 2009), there are not many real interventions successfully de-biasing consumers in mentioned inept decision-making. Nevertheless, even a small short-term attention shock can improve households' decision-making. For example, participants of a survey including questions focused on checking account overdraft fees subsequently show a lower probability of checking overdrafts in their real financial decisions (Stango & Zinman, 2014) or see (Bhargava & Manoli, 2015). Future research should examine more techniques to de-biasing some consumers or address the need of regulatory interventions.

4.5 References

- Anderson, S. T., Kellogg, R., Langer, A., & Sallee, J. M. (2013). The Intergenerational Transmission of Automobile Brand Preferences: Empirical Evidence and Implications for Firm Strategy. *National Bureau of Economic Research Working Paper Series, 19535*. doi: 10.3386/w19535
- Ariely, D., Loewenstein, G., & Prelec, D. (2003). "Coherent arbitrariness": Stable Demand Curves Without Stable Preferences. *The Quarterly Journal of Economics, 118*(1), 73-106. doi: 10.1162/00335530360535153
- Bakhshi, S., Kanuparth, P., & Gilbert, E. (2014). *Demographics, Weather and Online Reviews: A Study of Restaurant Recommendations*. Paper Presented at The Proceedings of the 23rd International Conference on World Wide Web.
- Beggs, A., & Graddy, K. (2009). Anchoring Effects: Evidence from Art Auctions. *The American Economic Review, 99*(3), 1027-1039. doi: 10.1257/aer.99.3.1027
- Bertrand, M., Karlan, D., Mullainathan, S., Shafir, E., & Zinman, J. (2010). What's Advertising Content Worth? Evidence from a Consumer Credit Marketing Field Experiment. *The Quarterly Journal of Economics, 125*(1), 263-306. doi: 10.1162/qjec.2010.125.1.263
- Bhargava, S., & Manoli, D. (2015). Psychological Frictions and the Incomplete Take-Up of Social Benefits: Evidence from an IRS Field Experiment. *American Economic Review, 105*(11), 3489-3529. doi: 10.1257/aer.20121493
- Birch, L. L. (1999). Development of Food Preferences. *Annual Review of Nutrition, 19*(1), 41-62. doi:10.1146/annurev.nutr.19.1.41
- Bordalo, P., Gennaioli, N., & Shleifer, A. (2012). Salience Theory of Choice Under Risk. *The Quarterly Journal of Economics, 127*(3), 1243-1285. doi: 10.1093/qje/qjs018
- Bordalo, P., Gennaioli, N., & Shleifer, A. (2013). Salience and Consumer Choice. *Journal of Political Economy, 121*(5), 803-843. doi: 10.1086/673885
- Bordalo, P., Gennaioli, N., & Shleifer, A. (2015). Memory, Attention and Choice. Retrieved from: http://scholar.harvard.edu/files/shleifer/files/evokedsets_march18_0.pdf
- Bronnenberg, B. J., Dubé, J.-P., Gentzkow, M., & Shapiro, J. M. (2015). Do Pharmacists Buy Bayer? Informed Shoppers and the Brand Premium. *The Quarterly Journal of Economics*. doi: 10.1093/qje/qjv024
- Bronnenberg, B. J., Dubé, J.-P. H., & Gentzkow, M. (2012). The Evolution of Brand Preferences: Evidence from Consumer Migration. *The American Economic Review, 102*(6), 2472-2508. doi: 10.1257/aer.102.6.2472
- Brown, J., Hossain, T., & Morgan, J. (2010). Shrouded Attributes and Information Suppression: Evidence from the Field. *The Quarterly Journal of Economics, 125*(2), 859-876. doi: 10.1162/qjec.2010.125.2.859

- Brown, J. R., & Goolsbee, A. (2002). Does the Internet Make Markets More Competitive? Evidence from the Life Insurance Industry. *Journal of Political Economy*, 110(3), 481-507. doi: 10.1086/339714
- Browne, M., Knoller, C., & Richter, A. (2015). Behavioral Bias and The Demand for Bicycle and Flood Insurance. *Journal of Risk and Uncertainty*, 50(2), 141-160. doi: 10.1007/s11166-015-9212-9
- Buchheim, L., & Kolaska, T. (forthcoming). Weather and the Psychology of Purchasing Outdoor-Movie Tickets. *Management Science*.
- Busse, M. R., Pope, D. G., Pope, J. C., & Silva-Risso, J. (2015). The Psychological Effect of Weather on Car Purchases. *The Quarterly Journal of Economics*, 130(1), 371-414. doi: 10.1093/qje/qju033
- Carlin, B. I. (2009). Strategic price complexity in retail financial markets. *Journal of Financial Economics*, 91(3), 278-287. doi: 10.1016/j.jfineco.2008.05.002
- Chaudhuri, A., & Holbrook, M. B. (2001). The Chain of Effects from Brand Trust and Brand Affect to Brand Performance: The Role of Brand Loyalty. *Journal of Marketing*, 65(2), 81-93. doi: 10.1509/jmkg.65.2.81.18255
- Chioveanu, I., & Zhou, J. (2013). Price Competition with Consumer Confusion. *Management Science*, 59(11), 2450-2469. doi: 10.1287/mnsc.2013.1716
- Clerides, S., & Courty, P. (2015). Sales, Quantity Surcharge, and Consumer Inattention. *Review of Economics and Statistics*. doi: 10.1162/REST_a_00562
- Cohen, J. B., Pham, M. T., & Andrade, E. B. (2008). The Nature and Role of Affect in Consumer Behavior. In C. P. Haugtvedt, P. Herr & F. Kardes (Eds.), *Handbook of consumer psychology* (pp. 297-348). New York: Psychology Press.
- Conlin, M., O'Donoghue, T., & Vogelsang, T. J. (2007). Projection Bias in Catalog Orders. *The American Economic Review*, 97(4), 1217-1249. doi: 10.2307/30034090
- DellaVigna, S. (2009). Psychology and Economics: Evidence from the Field. *Journal of Economic Literature*, 47(2), 315-372. doi: 10.1257/jel.47.2.315
- Eliaz, K., & Spiegel, R. (2011). Consideration Sets and Competitive Marketing. *The Review of Economic Studies*, 78(1), 235-262. doi: 10.1093/restud/rdq016
- Ellison, G., & Ellison, S. F. (2009). Search, Obfuscation, and Price Elasticities on the Internet. *Econometrica*, 77(2), 427-452. doi: 10.3982/ECTA5708
- Foxall, G. R. (2010). Invitation to Consumer Behavior Analysis. *Journal of Organizational Behavior Management*, 30(2), 92-109. doi: 10.1080/01608061003756307
- Gabaix, X., & Laibson, D. (2006). Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets. *Quarterly Journal of Economics*, 121(2), 505-540. doi: 10.1162/qjec.2006.121.2.505

- Gallagher, J. (2014). Learning about an Infrequent Event: Evidence from Flood Insurance Take-Up in the United States. *American Economic Journal: Applied Economics*, 6(3), 206-233. doi: 10.1257/app.6.3.206
- Genesove, D., & Mayer, C. (2001). Loss Aversion and Seller Behavior: Evidence from the Housing Market. *The Quarterly Journal of Economics*, 116(4), 1233-1260. doi: 10.1162/003355301753265561
- Gennaioli, N., & Shleifer, A. (2010). What Comes to Mind. *The Quarterly Journal of Economics*, 125(4), 1399-1433. doi: 10.1162/qjec.2010.125.4.1399
- Gorn, G. J., Goldberg, M. E., & Basu, K. (1993). Mood, Awareness, and Product Evaluation. *Journal of Consumer Psychology*, 2(3), 237-256. doi: 10.1016/S1057-7408(08)80016-2
- Greenleaf, E. A., Johnson, E. J., Morwitz, V. G., & Shalev, E. (2016). The Price Does Not Include Additional Taxes, Fees, and Surcharges: A Review of Research on Partitioned Pricing. *Journal of Consumer Psychology*, 26(1), 105-124. doi: 10.1016/j.jcps.2015.04.006
- Grubb, M. (2015). Failing to Choose the Best Price: Theory, Evidence, and Policy. *Review of Industrial Organization*, 47(3), 303-340. doi: 10.1007/s11151-015-9476-x
- Hauser, J. R., & Wernerfelt, B. (1990). An Evaluation Cost Model of Consideration Sets. *Journal of Consumer Research*, 16(4), 393-408. doi: 10.2307/2489451
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The Weirdest People in the World? *Behavioral and Brain Sciences*, 33(2-3), 61-83. doi:10.1017/S0140525X0999152X
- Hertwig, R., & Ortmann, A. (2001). Experimental Practices in Economics: A Methodological Challenge for Psychologists? *Behavioral and Brain Sciences*, 24(3), 383-403.
- Hortaçsu, A., Madanizadeh, S. A., & Puller, S. L. (2015). Power to Choose? An Analysis of Consumer Inertia in the Residential Electricity Market. *National Bureau of Economic Research Working Paper Series*, 20988. doi: 10.3386/w20988
- Hortaçsu, A., & Syverson, C. (2004). Product Differentiation, Search Costs, and Competition in the Mutual Fund Industry: A Case Study of S&P 500 Index Funds. *The Quarterly Journal of Economics*, 119(2), 403-456. doi: 10.1162/0033553041382184
- Houdek, P. (2016). What Comes to a Manager's Mind: Theory of Local Thinking. *Journal of Management Inquiry*. doi: 10.1177/1056492616640380
- Houdek, P., & Koblovský, P. (2015). Where is My Money? New Findings in Fiscal Psychology. *Society*, 52(2), 155-158. doi: 10.1007/s12115-015-9873-7
- Hoyer, W. D. (1984). An Examination of Consumer Decision Making for a Common Repeat Purchase Product. *Journal of Consumer Research*, 11(3), 822-829.

- Iyengar, S. S., & Kamenica, E. (2010). Choice Proliferation, Simplicity Seeking, and Asset Allocation. *Journal of Public Economics*, 94(7–8), 530-539. doi: 10.1016/j.jpubeco.2010.03.006
- Jessoe, K., & Rapson, D. (2014). Knowledge Is (Less) Power: Experimental Evidence from Residential Energy Use. *American Economic Review*, 104(4), 1417-1438. doi: 10.1257/aer.104.4.1417
- Kahneman, D., & Miller, D. T. (1986). Norm Theory: Comparing Reality to Its Alternatives. *Psychological Review*, 93(2), 136-152. doi: 10.1037/0033-295X.93.2.136
- Kramer, A. D. I., Guillory, J. E., & Hancock, J. T. (2014). Experimental Evidence of Massive-Scale Emotional Contagion Through Social Networks. *Proceedings of the National Academy of Sciences*, 111(24), 8788-8790. doi: 10.1073/pnas.1320040111
- Lacetera, N., Pope, D. G., & Sydnor, J. R. (2012). Heuristic Thinking and Limited Attention in the Car Market. *American Economic Review*, 102(5), 2206-2236. doi: 10.1257/aer.102.5.2206
- Loewenstein, G., O'Donoghue, T., & Rabin, M. (2003). Projection Bias in Predicting Future Utility. *Quarterly Journal of Economics*, 118(4), 1209-1248. doi: 10.1162/003355303322552784
- Maniadis, Z., Tufano, F., & List, J. A. (2014). One Swallow Doesn't Make a Summer: New Evidence on Anchoring Effects. *American Economic Review*, 104(1), 277-290. doi: 10.1257/aer.104.1.277
- Olshavsky, R. W., & Granbois, D. H. (2002). Consumer Decision Making-Fact or Fiction? In G. R. Foxall (Ed.), *Consumer Behavior Analysis: Critical Perspectives* (Vol. 1, pp. 369-374). New York, London: Routledge.
- Open Science Collaboration (2015). Estimating the Reproducibility of Psychological Science. *Science*, 349(6251), aac4716, doi: 10.1126/science.aac4716
- Ott, A. C. (2011). The Invisible Hand of Time: How Attention Scarcity Creates Innovation Opportunity. *IVEY Business Journal* (March/April).
- Reinaker, A., Cheng, Z., & Luo, X. (2015). Weather and Mobile Purchases: 10-Million-User Field Study. *Available at SSRN*. doi: 10.2139/ssrn.2585064
- Rind, B. (1996). Effect of Beliefs About Weather Conditions on Tipping. *Journal of Applied Social Psychology*, 26(2), 137-147. doi: 10.1111/j.1559-1816.1996.tb01842.x
- Roberts, J. H., & Lattin, J. M. (1997). Consideration: Review of Research and Prospects for Future Insights. *Journal of Marketing Research*, 34(3), 406-410. doi: 10.2307/3151902
- Schwarz, N. (2000). Emotion, Cognition, and Decision Making. *Cognition and Emotion*, 14(4), 433-440. doi: 10.1080/026999300402745

- Scott, F., & Yelowitz, A. (2010). Pricing Anomalies in the Market for Diamonds: Evidence of Conformist Behavior. *Economic Inquiry*, 48(2), 353-368. doi: 10.1111/j.1465-7295.2009.00237.x
- Simonsohn, U. (2006). New Yorkers Commute More Everywhere: Contrast Effects in the Field. *Review of Economics and Statistics*, 88(1), 1-9. doi: 10.1162/rest.2006.88.1.1
- Simonsohn, U., & Loewenstein, G. (2006). Mistake #37: The Effect of Previously Encountered Prices on Current Housing Demand. *The Economic Journal*, 116(508), 175-199. doi: 10.1111/j.1468-0297.2006.01052.x
- Simonson, I., & Tversky, A. (1992). Choice in Context - Tradeoff Contrast and Extremeness Aversion. *Journal of Marketing Research*, 29(3), 281-295.
- Smith, M. D., & Brynjolfsson, E. (2001). Consumer Decision-Making at an Internet Shopbot: Brand Still Matters. *The Journal of Industrial Economics*, 49(4), 541-558. doi: 10.1111/1467-6451.00162
- Spiegler, R. (2014). Competitive Framing. *American Economic Journal: Microeconomics*, 6(3), 35-58. doi: 10.1257/mic.6.3.35
- Stango, V., & Zinman, J. (2014). Limited and Varying Consumer Attention: Evidence from Shocks to the Salience of Bank Overdraft Fees. *Review of Financial Studies*, 27(4), 990-1030. doi: 10.1093/rfs/hhu008
- Thaler, R. H., & Sunstein, C. R. (2009). *Nudge: Improving decisions about health, wealth, and happiness*. London: Penguin Books.
- Tversky, A., Sattath, S., & Slovic, P. (1988). Contingent Weighting in Judgment and Choice. *Psychological Review*, 95(3), 371-384. doi: 10.1037/0033-295X.95.3.371
- Uncles, M., Ehrenberg, A., & Hammond, K. (2002). Patterns of Buyer Behavior: Regularities, Models, and Extensions. In G. R. Foxall (Ed.), *Consumer Behavior Analysis: Critical Perspectives* (Vol. 1, pp. 149-160). New York, London: Routledge.
- Viswanathan, M., Childers, T., & Moore, E. (2000). The Measurement of Intergenerational Communication and Influence on Consumption: Development, Validation, and Cross-Cultural Comparison of the IGEN Scale. *Journal of the Academy of Marketing Science*, 28(3), 406-424. doi: 10.1177/0092070300283008
- Zettelmeyer, F., Morton, F. S., & Silva-Risso, J. (2006). How the Internet Lowers Prices: Evidence from Matched Survey and Automobile Transaction Data. *Journal of Marketing Research*, 43(2), 168-181. doi:10.1509/jmkr.43.2.168

5. Professional Identity and Dishonest Behavior

Abstract

This essay discusses the fraud triangle, or how factors such as opportunity to cheat, motivation to cheat or ability to rationalize or justify dishonest behavior lead to dishonesty. The fraud triangle is applied on behavior of professionals active in occupations such as medicine, education, research and science or the clergy. Evidence shows that even in these occupations, which attract more altruistic individuals, the fraud triangle factors predicts emergence of behavior in breach of ethical standards. The conclusion mentions several measures for reducing dishonesty and emphasizes disciplines such as forensic economics or behavioral ethics provide more and more tools to detect dishonest behavior and possibilities for its reduction.

Keywords

dishonesty, fraud triangle, teachers, academics, researcher, physicians, clergy, ethics

5.1 Introduction

The fraud triangle is a simple tool used by auditors to identify the threat of fraud. The triangle consists of three circumstances that increase the likelihood of dishonest behavior. People cheat if they have i) the opportunity to cheat, ii) the motivation to cheat, and iii) the ability to rationalize or justify their dishonest behavior.

The goal of this essay is to show that the fraud triangle is a relevant tool, which can be used to describe behavior of professionals also in occupations that are generally considered as requiring high level of professionalism and in which ethical standards are not only more important but also more enforced, such as medicine, education, science or the clergy.

In this essay I use contemporary developments in forensic economics (Zitzewitz, 2012) and behavioral ethics (Bazerman & Gino, 2012; Pierce & Balasubramanian, 2015; Vranka & Houdek, 2015). These disciplines use real data analysis and controlled laboratory and field experiments to discover the scope of secretive behavior of people and the factors, which affect their decisions and behavior in situations in which they potentially breach legal or ethical norms.

The essay is further structured as follows: in the next chapter I use several case studies to illustrate particular factors of the fraud triangle. The following sections address fraud of professionals in particular professions, in which one's occupation should also represent one's life mission. The conclusion states some measures that could limit dishonest behavior.

5.2 Opportunity to cheat

Opportunity to commit fraud is associated with poor organization of groups of people, firms or offices that fail to set appropriate standards of behavior, fail to enforce these standards or fail to enforce them effectively. For example, if road regulations aren't enforced, the rate of

accidents will naturally rise; reduction of road police forces to one third may result in 12-29% rise in rate of accidents in which a person is injured or killed (DeAngelo & Hansen, 2014). On the other hand, implementation of effective inspections can reduce corruption and public sector expenses (Di Tella & Schargrodsky, 2003). In general, the poorer the quality of corporate governance is (for example if the board is not independent from the management, there is a lack of audit department, etc.), the higher the rate of accounting enforcement actions by the Securities and Exchange Commission for alleged violations of Generally Accepted Accounting Principles occurs (Dechow, Sloan, & Sweeney, 1996). If executives have extremely powerful position in a company, the probability of fraudulent behavior rises, „the probability of restatement [of earnings] is about .32 higher in firms in which the CEO belongs to the founding family” (Agrawal & Chadha, 2005: 403).

Counterparties' disadvantages in access to information, regardless of whether these are other people, customers or the regulatory authorities, offer further opportunities for people to cheat. If the counterparty cannot adequately assess the quality of the offered service or product, the offering side is presented with an opportunity to use such situation to its own advantage (see also (Houdek & Koblovský, 2015)). Meghan Busse, Ayelet Israeli and Florian Zettelmeyer in their field experiment tested, if car mechanics will discriminate their customers in price if they find out that they have a chance to make money off of such customers. Role-playing figurants hired by the experimenters, both men and women, called to more than 3,000 American car repairs shops and asked how much a change of a radiator on a specific type of Toyota would cost. The first group of (informed) callers let the mechanics know that they researched the customary price of the radiator, USD 365, online at AutoMD.com. The second group of (uninformed) callers didn't mention price during negotiations at all. And the last group of (wrongly informed) callers mentioned that they researched the customary price online at AutoMD.com, but mentioned price of USD 510, a significantly higher amount. The

results are expectable: the car mechanics did seize their advantage and responded differently to men and women. If the caller-man quoted the correct price or didn't mentioned it at all, he received almost similar price estimation of the repair. In case the caller-man mentioned the higher price, the mechanic took advantage. Women were offered the fair price only in cases when they demonstrated that they know what the correct price should be. In case they did not mention the price or mentioned the wrong (higher) price, the mechanics seized the opportunity to easy money. The experiment shows that car mechanics are aware of the fact that women tend to be less experienced in the automobile industry than men and that mechanics do use this knowledge for their own benefit.

Henry Schneider (2012) arrived at similar conclusions. In a field experiment he visited car repair shops in a car with predefined defects and researched, if the mechanics discover the defects and offer him a fair price for its repair. In one third of cases, the mechanics offered a repair job that was significantly more expensive than what was necessary or a repair job that was irrelevant for the given defect (for example: instead of connecting a cable to car battery, a full exchange of engine was offered). Similarly taxi drivers take advantage of the fact, that tourists lack information about the local conditions and charge higher prices (Balafoutas, Beck, Kerschbamer, & Sutter, 2013). Real estate agents are less dedicated when it comes to advice given to their clients as opposed to effort they give with respect to sales of their own houses, which leads to the fact that „agent-owned homes sell for about 3.7% (or roughly \$7,600 at the median sales price) more than comparable houses and stay on the market an extra 9.5 days (about 10%) longer” (Levitt & Syverson, 2008: 400).

5.3 Motivation to behave dishonesty

Motivation to acquire assets (property, advantages, status) not attainable by honest means is an obvious reason to behave dishonestly. If the reward from dishonest behavior increases, so

does the motivation to engage in such behavior. For example, with rising prices of goods, the possibility of the goods being stolen also rises (Draca, Koutmeridis, & Machin, 2015); number of employees who reported sick increases when major sporting events are on TV (Thoursie, 2004), and journalists write more favorably about companies that are major advertisers of their newspapers (Gambaro & Puglisi, 2015).

Managers are motivated by significant bonuses based on defined performance or financial indicators. The higher aspiration levels such executives must reach (Schweitzer, Ordóñez, & Douma, 2004) or the higher their bonuses are, the more intense motivation to commit fraud they face. For example, one of the studies found “that CEOs with substantial amounts of in-the-money options are more likely to issue financial statements with non-GAAP accounting irregularities... Moreover, we find that the value of in-the-money options distinguishes between the likelihood of substantial accounting malfeasance, other accounting irregularities, and no misstatement” (Efendi, Srivastava, & Swanson, 2007: 703-4).

Many employees, on the other hand, associate motivation to cheat with impending problems on financial or personal level, which they seek to solve by fraudulent behavior. A lot of employees start to embezzle company money, because they have debts from gambling or lack the financial means to fund their drug addiction or divorce. As Scott Rick and George Loewenstein summarize: „A wide range of evidence suggests that people who find themselves “in a hole” and believe that dishonest behavior is the only apparent means of escape are more likely to cheat, steal, and lie” (2008: 645). There is a plethora of different motivations to cheat. A lot of employees intensely perceive the way their employer or their colleagues treat them, and in case they sense unjust or unfair behavior, they start to despise firm’s identity, which in turn leads them to dishonest behavior (Nagin, Rebitzer, Sanders, &

Taylor, 2002). Some people are simply greedy and materialistic and fraud is a direct way to accomplish their desires (Dellaportas, 2013).

Often, however, morality valence depends on the context and sometimes even intended deception may be ethical behavior. For example, many people lie to actually help others (Erat & Gneezy, 2012). These white lies can transform immoral behavior into virtuous actions. As Gaspar, Levine, & Schweitzer (2015: 307) fittingly noted: "... by focusing on the costs of deception, we have ignored the potential costs of honesty. Honesty, like deception, can be used to cause pain and harm to others". (I will return to this point later; see a section The clergy and (honest) deception.)

Motivation to cheat is closely related to rationalization of fraudulent behavior – the ability to justify one's own questionable or morally ambiguous behavior, regardless of whether to maintain and justify their identity of a moral person to themselves or to present a more favorable image to others.

5.4 Rationalization of dishonesty

Rationalization or justification is a mental process that aligns a person's morally dubious behavior with his/her personal values or ethical standards in such a way that the person appears (perceives himself) as moral, despite his/her immoral behavior (Shalvi, Gino, Barkan, & Ayal, 2015). As stipulated above, employees steal from their employer more if they feel that he acted towards them unfairly – for example because the employer lowered their salaries (Greenberg, 1990). In their own eyes, they simply "right" the injustice done to them and,

despite the fact that they behave immorally, they do not consider themselves as immoral people.

On the other hand, if people behaves morally, they may get the sense that they “deserved” the right to act less morally later. A psychological phenomenon of moral licensing occurs. In one laboratory experiment a single positive story containing a description of their own personality as “caring, generous, fair, and kind” sufficed to make the participants to be less willing to donate to charity (Sachdeva, Iliev, & Medin, 2009).

Another aspect of rationalization may occur with substituting one moral value by other – for example by striving to achieve professional expertise. In an experiment, in which students were allowed either to show how intelligent they are or to save a life of a mouse, Armin Falk and Nora Szech (2016) illustratively demonstrated to what extent people are willing to subdue or forget morality when trying to prove and display their intelligence. All students (participants in the experiment) were awarded a lump sum reward for taking part in the experiment regardless of how well they manage in the experiment. The students in the first group were informed that they will take part in an IQ test and at the end they will be given the results and will be able to compare themselves to others. They also read a notice on the importance of IQ for academic and professional success. The second group was informed that they will take part in some kind of a questionnaire survey and that they will get the results at the end. In reality, both groups were given the same IQ test but second group’s task was presented as simple questionnaire survey, so the participants wouldn’t feel pressure or ambition to succeed.

The performance of one half of the participants in each group was simply calculated. However, a moral aspect was assigned to the performance of the other half. Each of the participants (in the second half) was assigned one mouse prior commencing the test and was

informed that the probability of the assigned mouse being gassed (it was a “surplus” mouse which would be killed by the university regardless by default) would be higher if the participant answers more questions correctly. Each correct answer would increase the probability of gassing the mouse by .9 percentage point. The maximum probability (in case of all correct answers) was 46.8%. If the participant answered all questions incorrectly, the mouse would surely survive. To the participants it was subsequently explained, how the mouse would die and an instruction video depicting the whole process was showed.

The results of the experiment confirmed that students who strived to get their IQ measured achieved better results than students who were simply “filling out a questionnaire”. The difference of 22% attained simply by framing and presenting it as an IQ test demonstrates how significant the effect of trying to succeed in something is. The study discovered that students whose correct answers could lead to possible killing of mouse did worse on the test – they answered that they “didn’t know” more often. Many tried to save the mouse. However, in the group that was aware of filling in an IQ test, this decrease of correct answers between the two groups was much smaller. Regardless of the drastic, fatal impact of their answers, they tried to achieve high score. The striving for success simply overshadowed their perspective on moral missteps.

5.5 Schools and cheating teachers

Standardized testing aims to measure added value of academic performance of schools. The No Child Left Behind Act of 2001 established new responsibility of schools in the USA to regularly test students. Based on results of these tests, finances are awarded to schools, personal policy is determined, individual teachers are rewarded based on their contribution to increase of knowledge of their students. Such environment is supposed to motivate schools to increase the knowledge of their students. This may, however, be achieved not only by

implementing more effective teaching methods and hiring better teachers, but also by rigging the system – by targeted preparation for the questions tested (test specific skills), by manipulation with the population of students actually taking the test or directly by fraud.

David Figlio and Lawrence Getzler used the initiation of the Florida Comprehensive Assessment Test (FCAT) and found “that following the introduction of the FCAT testing program low-performing students and students from low socioeconomic backgrounds were significantly and substantively more likely to be reclassified into disability categories exempted from the accountability system... We also find that high-poverty schools are significantly more likely to reclassify low-achieving students than are more affluent schools” (2006: 37). Similarly, Brian Jacob, based on analysis of accountability policy implemented in the Chicago Public Schools, discovered that „teachers responded strategically to the incentives along a variety of dimensions—by increasing special education placements, preemptively retaining students and substituting away from low-stakes subjects like science and social studies [subjects that are not included in the accountability policy]” (2005: 763).

Schools may affect the population of their students also by subtler measures, such as composition of nutritional value of food (Figlio & Winicki, 2005). It is supported by many findings that high-caloric, in particular sweet foods can increase momentary cognitive abilities or concentration (Hoyland, Lawton, & Dye, 2008). Based on comparison of nutritional value of lunches on the day of tests and other days, David Figlio and Joshua Winicki confirmed that schools with worse test results serve more caloric dishes to students on test days. They also showed that this strategy is rather successful. Schools that increase the intake of calories achieve better results on tests (however, the study cannot exclude if the effect isn't caused also by other measures, which the schools implemented in parallel).

Teaching targeted for tests, segregation of students and richer food may be considered as ethical and rational reactions of schools. If the tests would cover complex range of knowledge and abilities of students, then the targeted preparation for such tests would in fact increase the desirable knowledge and abilities of students. Transferring students to special classes may be a result of a detailed assessment of such student and his or her correct assignment to special needs program. However, schools also use clearly manipulative measures. Before test days, they may suspend students with worse grades who would probably worsen the school's results, or, on the other hand, schools may not suspend with good grades. Although students with worse grades are generally sanctioned more, during test days this asymmetry is further deepened (Figlio, 2006). Based on data from the FCAT and 41,803 incidents of suspension of students, David Figlio discovered that the increase in suspension of students with worse grades generally takes place during the days on which tests are taken and across classes who take the tests. This implies that suspension of inferior students is a targeted and thought-out strategy to achieve better aggregate test results.

Teachers directly forge test results as well. In order to determine the prevalence of cheating teachers, Brian Jacob and Steven Levitt (2003) used empirical study in which they identified uncommon patterns of correct answers. For example, it is improbable that all students in one class answer a whole sequence of questions correctly or if they answer the easy questions incorrectly and the harder ones correctly. Similar correlation of correct answers among students indicates that the teacher cheated by marking whole sequences of answers as correct. Radical improvement of a student in one year and a drop-off (or constant decline) in the following also points out to cheating of the teacher. Based on administrative data from the Chicago public schools that includes the question-by-question answers given by every student who took the Iowa Test of Basic Skills from 1993 to 2000, Jacob and Levitt discovered that similar fraudulent patterns of correct answers may be identified in roughly 4 to 5% of classes.

Their method was further confirmed by a prospective test, when the classes they identified as possibly cheating, achieved much worse results when they were re-tested, whereas decline didn't occur in classes that weren't suspected of cheating. The study also shows that cheating is more common in low-achieving classrooms and, on the other hand, less common in classes of special needs, the results of which are not counted to the official school results.

5.6 Science and scientists

In the recent years, series of significant scientific frauds took place. The most prominent instance in the field of social sciences is the case of a Dutch social psychologist, Diederik Stapel, who falsified or manipulated research data throughout his whole career. Dozens of his articles that appeared in prestigious journals and were often co-authored by distinguished psychologists had to be retracted. However, as was pointed out by Wolfgang Stroebe, Tom Postmes, and Russell Spears (2012), neither Stapel's fraud, nor most of similar cases were discovered by traditional scientific procedures such as peer-review, independent methods and/or results replications or inspections carried out by grant committees. Most of fraudulent behavior in science is revealed by whistle-blowers (Stapel's fraud began to emerge when his doctorate students challenged the credibility of his data).

However, as can be deduced even from publicly available data, problematic scientific practices are probably not limited to few rare cases but may be rather frequent. A study focused on management sciences and observed how much do hypotheses, data and results in the author's dissertation change in comparison to articles published based on such dissertation. Any such modifications and manipulations are commonly considered as academic misconduct or problematic research practices. The authors discovered that „the ratio of supported to unsupported hypotheses more than doubled... The rise in predictive accuracy resulted from the dropping of statistically nonsignificant hypotheses, the addition of

statistically significant hypotheses, the reversing of predicted direction of hypotheses, and alterations to data” (O’Boyle, Banks, & Gonzalez-Mulé, 2014: 1). Similarly, Uri Simonsohn (2013) showed that simple statistical analysis of raw data may be used to identify the ambiguity and doubtfulness of results of prominent psychological studies which are suspected of fraud. He concludes by emphasizing the importance of disclosure of raw data so that published results may be inspected and checked via independent reproductions of such results.

David Markowitz and Jeffrey Hancock utilized different approach to identify problematic papers; they used linguistic analysis and found that „[f]raudulent papers were written with significantly higher levels of linguistic obfuscation, including lower readability and higher rates of jargon than un-retracted and non-fraudulent papers. We also observed a positive association between obfuscation and the number of references per paper, suggesting that fraudulent authors obfuscate their reports to mask their deception by making them more costly to analyze and evaluate” (2015: 1).

Dishonesty isn’t limited to publishing falsified results, it affects also subtler behavior. Benjamin Edelman and Ian Larkin (2015) analyzed data on downloads of working papers from the SSRN database (online web based repository of scholarly research). Since the number of downloads is a matter of prestige and the ranking of most-downloaded papers is used by a number of academic institutions for determining the future career prospects of scientists, the scientists have incentive to increase the number of downloads, e.g. by downloading the paper repeatedly themselves. Edelman and Larkin discovered that such practice is used mostly by full professors and in particular when the papers of their colleagues are successful, or if the papers of their colleagues are published in similar e-journals or if their studies are approaching the borderline of a meaningful standard.

5.7 Healthcare and physicians

Healthcare workers should serve as perfect agents of their patients' interests in relation to diagnosis, treatment, medicine prescription or aftercare. But in reality the doctors' interests often take precedence over the interests of their patients. For example, if physicians both prescribe and dispense medicine, they can either prescribe larger quantities or more expensive drugs than needed, thus taking advantage of the mark-up for their own benefit. Using Japanese data on issuance of medicine for high blood pressure Toshiaki Iizuka (2007) demonstrated that such practices in fact really do take place. Had the mark-up been eliminated, the expenses would be reduced by 11-15%. Another study (Domenighetti, Casabianca, Gutzwiller, & Martinoli, 1993) acquired Swiss data on frequency of common surgeries on a representative sample of Swiss population and showed that doctors are much less likely to undergo such surgeries (except appendectomy, an operation spread similarly across all groups). The accepted explanation claims that doctors-patients are the golden standard showing that a lot of surgeries are performed redundantly among the common population. The only exception of group of people with similarly low probability of undergoing surgeries as doctors were lawyers. The study "suggests that lawyers seem to be considered by their physicians as "special patients" and thus that the medical profession could be more prudent in their evaluation of lawyers' indications for elective surgery. This is because the lawyer could be a "risky" patient, being potentially able to cause more legal troubles to the physician than most ordinary patients, should the surgery result in an adverse event or outcome. The similarity of the prevalence between physicians and lawyers may also be regarded as indirect evidence that the physician-patient's consumption could represent a reference use value, in particular as an indicator of physician-induced demand" (Domenighetti, et al., 1993: 512).

Along the same lines but with different opportunities to dishonest behavior, Shin-Yi Chou (2002) compared the quality of treatment between for-profit and non-profit organizations using nursing home data. She found out that the treatment quality stays the same only in cases when family members regularly check up on the patient, i.e. the patients are regularly visited. If the family doesn't visit regularly, the patients in the for-profit organization are provided with a much lower quality treatment (measured for example by frequency of having dehydration and urinary tract infections).

Similarly, Jonathan Gruber and Maria Owings (1996) demonstrated that obstetricians/gynecologists more often substitute the natural childbirth delivery by C-section, a highly reimbursed alternative, when the birth rate declines in a given region. A similar result was presented by (Gans, Leigh, & Varganova, 2007), who analyzed Australian and American data and discovered that the birth rate falls by as much as 4% during annual obstetricians and gynecologists' conferences. Since it cannot be expected that parents take the schedule of these conferences into account when planning the birth of their child, it more likely indicates that doctors plan deliveries to suit their conference schedule.

5.8 The clergy and (honest) deception

Despite the number of news on individual moral missteps of priests, there aren't many studies systematically revealing dishonest behavior among the clergy. In one laboratory study (Utikal & Fischbacher, 2013) it was showed that the Franciscan nuns lie more than control group of participants. However, the reason why they lied was to gain less money that they possibly could get; they probably want to appear as being modest or as having aversion to greed.

Similar deceptive behavior – however in its essence and consequences for good cause – was researched by Peter Leeson (2012) with relation to medieval trials by ordeal. For many centuries in the Middle Ages, judicial disputes were determined by, among others, trials by

ordeal, i.e. so-called God's judgements. The accused was subjected to a test of putting his hand in a kettle of boiling water and retrieving a ring or walking nine steps while carrying red-hot iron. If the accused escaped injury or death, he was considered innocent. If not, he was considered guilty. Via the priest who administered the test, God expressed his will – *iudicium Dei*, and liberated the innocent and condemned the guilty. Although ordeals seem as a totally unfair and superstitious procedure from today's perspective, the practice was quite successful considering that there were no professional police, judges or evidentiary proceedings in the Middle Ages.

The reason why it worked quite well was because the majority of people strongly believed in God as well as in *iudicium Dei*. Therefore, in particular the innocent was willing to undergo the trial by ordeal, whereas the real perpetrators rather plead guilty or were more inclined to settle the issue out-of-court rather than being judged by God. Based on historic data on ordeals Leeson shows that the accused was in fact proven innocent in majority of cases. The priest themselves thus "cheated" and gave the accused who were willing to undergo the trial by ordeal a decent chance for liberation. The priests themselves hence couldn't believe in *iudicium Dei*.

Almost perfect parallel to ordeals can be nowadays seen in Liberia, where the judicial system fell apart and the people return to a traditional procedure of "sassywood" to settle their disputes instead (Leeson & Coyne, 2012). The accused are forced to eat toxic bark of the *Erythrophleum suaveolens*, or sasswood tree, in which the spirit-who-knows-the-truth resides. The perpetrator is poisoned by the poison, whereas the innocent throws it up and survives. The procedure is also administered by a spiritual leader who evidently manipulates the results by putting various amount of the poison into the food.

5.9 Conclusion

The article dealt with dishonest or norm-violating behavior of professionals active in occupations that are said to require a higher ethical standard. The goal of this article was not to show that these professions are populated by hypocrites. The purpose was to demonstrate that factors such as opportunity and motivation to cheat or ability to justify one's dishonest actions are able to explain the increasing rate of dishonest or deceptive behavior in sector, in which even the most altruistic individuals are concentrated. In other sectors, the rate of dishonesty may be much higher.

The fraud triangle provides for an inspiration how to limit such dishonest behavior. If people are stripped of the opportunity to commit fraud, they cannot take part therein. The study on downloads of SSRN papers shows that if a webpage implements measures preventing fraudulent downloads, the practice of downloading one's own papers will disappear. If people are perceived as knowledgeable in a given field (as showed by the examples of informed men and women getting cheaper car repairs or by lawyers who undergo surgeries on a lower rate than other groups), they are less likely to be cheated. Therefore, measures eliminating information asymmetry, such as webpages comparing competing providers, measures taken by organization for protection of consumers or a simple demonstration that the individual knows what he or she is talking about seem as possible solutions (Gneezy, List, & Price, 2012). Similarly, if people won't be motivated to cheat because the chance of getting caught and apprehended was high enough, the non-ethical behavior will decline (Nagin, 2013). The same applies for eliminating or limiting people's possibilities to rationalize their non-ethical behavior (Zhang, Gino, & Bazerman, 2014).

Development of forensic economics, behavioral psychology and other disciplines provide increasingly detailed tools for detecting and discovering dishonest actions. Not only do they

identify dishonest processes and their scope but by examining the causal factors, such tools are able to suggest measures for elimination or limitation of such behavior.

5.10 References

- Agrawal, A., & Chadha, S. (2005). Corporate Governance and Accounting Scandals. *The Journal of Law and Economics*, 48(2), 371-406. doi: 10.1086/430808
- Balafoutas, L., Beck, A., Kerschbamer, R., & Sutter, M. (2013). What Drives Taxi Drivers? A Field Experiment on Fraud in a Market for Credence Goods. *The Review of Economic Studies*, 80(3), 876-891. doi: 10.1093/restud/rds049
- Bazerman, M. H., & Gino, F. (2012). Behavioral Ethics: Toward a Deeper Understanding of Moral Judgment and Dishonesty. *Annual Review of Law and Social Science*, 8(1), 85-104. doi: 10.1146/annurev-lawsocsci-102811-173815
- Busse, M. R., Israeli, A., & Zettelmeyer, F. (2016). Repairing the Damage: The Effect of Price Knowledge and Gender on Auto-Repair Price Quotes. *Journal of Marketing Research*. doi: 10.1509/jmr.13.0291
- DeAngelo, G., & Hansen, B. (2014). Life and Death in the Fast Lane: Police Enforcement and Traffic Fatalities. *American Economic Journal: Economic Policy*, 6(2), 231-257. doi: 10.1257/pol.6.2.231
- Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1996). Causes and Consequences of Earnings Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC. *Contemporary Accounting Research*, 13(1), 1-36. doi: 10.1111/j.1911-3846.1996.tb00489.x
- Dellaportas, S. (2013). Conversations with inmate accountants: Motivation, opportunity and the fraud triangle. *Accounting Forum*, 37(1), 29-39. doi: 10.1016/j.accfor.2012.09.003
- Di Tella, R., & Schargrodsky, E. (2003). The Role of Wages and Auditing during a Crackdown on Corruption in the City of Buenos Aires. *The Journal of Law & Economics*, 46(1), 269-292. doi: 10.1086/345578
- Domenighetti, G., Casabianca, A., Gutzwiller, F., & Martinoli, S. (1993). Revisiting the Most Informed Consumer of Surgical Services: The Physician-Patient. *International Journal of Technology Assessment in Health Care*, 9(04), 505-513. doi: 10.1017/S0266462300005420
- Draca, M., Koutmeridis, T., & Machin, S. J. (2015). The changing returns to crime: do criminals respond to prices? *CEPR Discussion Paper No. DP10647*
- Edelman, B., & Larkin, I. (2015). Social Comparisons and Deception Across Workplace Hierarchies: Field and Experimental Evidence. *Organization Science*, 26(1), 78-98. doi: 10.1287/orsc.2014.0938

- Efendi, J., Srivastava, A., & Swanson, E. P. (2007). Why do corporate managers misstate financial statements? The role of option compensation and other factors. *Journal of Financial Economics*, 85(3), 667-708. doi: 10.1016/j.jfineco.2006.05.009
- Erat, S., & Gneezy, U. (2012). White Lies. *Management Science*, 58(4), 723-733. doi: 10.1287/mnsc.1110.1449
- Falk, A., & Szech, N. (2016). Pleasures of skill and moral conduct. *CESifo Working Paper Series No. 5732*.
- Figlio, D. N. (2006). Testing, crime and punishment. *Journal of Public Economics*, 90(4-5), 837-851. doi: 10.1016/j.jpubeco.2005.01.003
- Figlio, D. N., & Getzler, L. S. (2006). Accountability, ability and disability: Gaming the system? In T. J. Gronberg & D. W. Jansen (Eds.), *Advances in applied microeconomics* (Vol. 14, pp. 35-49). Amsterdam: Elsevier.
- Figlio, D. N., & Winicki, J. (2005). Food for thought: the effects of school accountability plans on school nutrition. *Journal of Public Economics*, 89(2-3), 381-394. doi: 10.1016/j.jpubeco.2003.10.007
- Gambaro, M., & Puglisi, R. (2015). What do ads buy? Daily coverage of listed companies on the Italian press. *European Journal of Political Economy*, 39, 41-57. doi: 10.1016/j.ejpoleco.2015.03.008
- Gans, J. S., Leigh, A., & Varganova, E. (2007). Minding the shop: The case of obstetrics conferences. *Social Science & Medicine*, 65(7), 1458-1465. doi: 10.1016/j.socscimed.2007.05.034
- Gaspar, J. P., Levine, E. E., & Schweitzer, M. E. (2015). Why we should lie. *Organizational Dynamics*, 44(4), 306-309. doi: 10.1016/j.orgdyn.2015.09.008
- Gneezy, U., List, J., & Price, M. K. (2012). Toward an Understanding of Why People Discriminate: Evidence from a Series of Natural Field Experiments. *National Bureau of Economic Research Working Paper Series, No. 17855*.
- Greenberg, J. (1990). Employee theft as a reaction to underpayment inequity: The hidden cost of pay cuts. *Journal of Applied Psychology*, 75(5), 561-568. doi: 10.1037/0021-9010.75.5.561
- Gruber, J., & Owings, M. (1996). Physician Financial Incentives and Cesarean Section Delivery. *The RAND Journal of Economics*, 27(1), 99-123. doi: 10.2307/2555794
- Houdek, P., & Koblovský, P. (2015). Where is My Money? New Findings in Fiscal Psychology. *Society*, 52(2), 155-158. doi: 10.1007/s12115-015-9873-7
- Hoyland, A., Lawton, C. L., & Dye, L. (2008). Acute effects of macronutrient manipulations on cognitive test performance in healthy young adults: A systematic research review.

- Neuroscience & Biobehavioral Reviews*, 32(1), 72-85. doi: 10.1016/j.neubiorev.2007.05.006
- Chou, S.-Y. (2002). Asymmetric information, ownership and quality of care: an empirical analysis of nursing homes. *Journal of Health Economics*, 21(2), 293-311. doi: 10.1016/S0167-6296(01)00123-0
- Iizuka, T. (2007). Experts' agency problems: evidence from the prescription drug market in Japan. *The RAND Journal of Economics*, 38(3), 844-862. doi: 10.1111/j.0741-6261.2007.00115.x
- Jacob, B. A. (2005). Accountability, incentives and behavior: the impact of high-stakes testing in the Chicago Public Schools. *Journal of Public Economics*, 89(5-6), 761-796. doi: 10.1016/j.jpubeco.2004.08.004
- Jacob, B. A., & Levitt, S. D. (2003). Rotten Apples: An Investigation of the Prevalence and Predictors of Teacher Cheating. *The Quarterly Journal of Economics*, 118(3), 843-877. doi: 10.1162/00335530360698441
- Leeson, P. T. (2012). Ordeals. *The Journal of Law & Economics*, 55(3), 691-714. doi: 10.1086/664010
- Leeson, P. T., & Coyne, C. J. (2012). Sassywood. *Journal of Comparative Economics*, 40(4), 608-620. doi: 10.1016/j.jce.2012.02.002
- Levitt, S. D., & Syverson, C. (2008). Market Distortions When Agents Are Better Informed: The Value of Information in Real Estate Transactions. *Review of Economics and Statistics*, 90(4), 599-611. doi: 10.1162/rest.90.4.599
- Markowitz, D. M., & Hancock, J. T. (2015). Linguistic Obfuscation in Fraudulent Science. *Journal of Language and Social Psychology*. doi: 10.1177/0261927x15614605
- Nagin, D. S. (2013). Deterrence: A Review of the Evidence by a Criminologist for Economists. *Annual Review of Economics*, 5(1), 83-105. doi: 10.1146/annurev-economics-072412-131310
- Nagin, D. S., Rebitzer, J. B., Sanders, S., & Taylor, L. J. (2002). Monitoring, Motivation, and Management: The Determinants of Opportunistic Behavior in a Field Experiment. *American Economic Review*, 92(4), 850-873. doi: 10.1257/00028280260344498
- O'Boyle, E. H., Banks, G. C., & Gonzalez-Mulé, E. (2014). The Chrysalis Effect: How Ugly Initial Results Metamorphosize Into Beautiful Articles. *Journal of Management*. doi: 10.1177/0149206314527133
- Pierce, L., & Balasubramanian, P. (2015). Behavioral field evidence on psychological and social factors in dishonesty and misconduct. *Current Opinion in Psychology*, 6, 70-76. doi: 10.1016/j.copsyc.2015.04.002
- Rick, S., & Loewenstein, G. (2008). Hypermotivation. *Journal of Marketing Research*, 45(6), 645-648. doi: 10.1509/jmkr.45.6.645

- Sachdeva, S., Iliev, R., & Medin, D. L. (2009). Sinning Saints and Saintly Sinners: The Paradox of Moral Self-Regulation. *Psychological Science*, 20(4), 523-528. doi: 10.1111/j.1467-9280.2009.02326.x
- Shalvi, S., Gino, F., Barkan, R., & Ayal, S. (2015). Self-Serving Justifications: Doing Wrong and Feeling Moral. *Current Directions in Psychological Science*, 24(2), 125-130. doi: 10.1177/0963721414553264
- Schneider, H. S. (2012). Agency Problems and Reputation in Expert Services: Evidence from Auto Repair. *The Journal of Industrial Economics*, 60(3), 406-433. doi: 10.1111/j.1467-6451.2012.00485.x
- Schweitzer, M. E., Ordóñez, L., & Douma, B. (2004). Goal Setting as a Motivator of Unethical Behavior. *The Academy of Management Journal*, 47(3), 422-432. doi: 10.2307/20159591
- Simonsohn, U. (2013). Just Post It: The Lesson From Two Cases of Fabricated Data Detected by Statistics Alone. *Psychological Science*. doi: 10.1177/0956797613480366
- Stroebe, W., Postmes, T., & Spears, R. (2012). Scientific Misconduct and the Myth of Self-Correction in Science. *Perspectives on Psychological Science*, 7(6), 670-688. doi: 10.1177/1745691612460687
- Thoursie, P. S. (2004). Reporting sick: are sporting events contagious? *Journal of Applied Econometrics*, 19(6), 809-823. doi: 10.1002/jae.758
- Utikal, V., & Fischbacher, U. (2013). Disadvantageous lies in individual decisions. *Journal of Economic Behavior & Organization*, 85, 108-111. doi: 10.1016/j.jebo.2012.11.011
- Vranka, M. A., & Houdek, P. (2015). Many Faces of Bankers' Identity: How (not) to study dishonesty. *Frontiers in Psychology*, 6(302). doi: 10.3389/fpsyg.2015.00302
- Zhang, T., Gino, F., & Bazerman, M. H. (2014). Morality rebooted: Exploring simple fixes to our moral bugs. *Research in Organizational Behavior*, 34, 63-79. doi: 10.1016/j.riob.2014.10.002
- Zitzewitz, E. (2012). Forensic economics. *Journal of Economic Literature*, 50(3), 731-769. doi: 10.1257/jel.50.3.731

6. Puppet Master: Possible Influence of Parasite *Toxoplasma gondii* on Managers and Employees

Abstract

The article reviews recent literature on the effects of host manipulation by a parasite *Toxoplasma gondii* (prevalent in about a third of the world population) on perception, cognition and behavior of humans, and on the changes in their physical appearance and personality characteristics. It is argued that utilization of the mind-affecting parasite paradigm offers many research opportunities for management sciences, especially for organizational psychology and neuroscience. The article summarizes the parasite's physiological mechanisms of affecting the host, important behavioral effects of the infection in humans and speculates on the possible impacts on skills and careers of employees and managers, organizational dynamics, inter-cultural management, and gender work roles. The conclusion shows limitations of the presented speculations and possible directions for future research on *Toxoplasma's* effect on organizational dynamics.

Keywords

behavioral manipulation; cognition; dopamine; extraversion; organizational neuroscience; personality; physical appearance; testosterone; *Toxoplasma gondii*

6.1 Introduction

Toxoplasmosis is a disease caused by the unicellular parasite *Toxoplasma gondii*. This infection afflicts 30 to 40 percent of worldwide human population and the prevalence of toxoplasmosis, unlike most other pathogens, is high even in some developed countries (Tenter, Heckeroth, & Weiss, 2000), see Figure 1. The disease is clinically latent and infected people usually do not show any visible symptoms, therefore most of the afflicted people are unaware of their infection. Nevertheless, knowing the “life and work” of the parasite is useful for organizational researchers and practicing managers as well, because *Toxoplasma* is able to covertly alter cognition and personal characteristics of infected individuals. It systematically changes their physical appearance, human capital and health (Flegr, 2013a, 2013b; Webster, Kaushik, Bristow, & McConkey, 2013). The higher possibility of a car accident in *Toxoplasma*-positive RhD-negative subjects means that toxoplasmosis could actually be one of the deadliest parasitic diseases (Flegr, Klose, Novotna, Berenreitterova, & Havlicek, 2009; Rh factor is one of the blood group systems and RhD-positive subjects are less sensitive to the influence of toxoplasmosis manipulations; for more details see Novotná et al. 2008). The aim of this paper is to show how toxoplasmosis might influence the cognitive and personality characteristics of employees and managers, and offer speculations on the possible impacts of these changes on the careers of the infected people and on organizational dynamics.

Toxoplasma affects behavior of infected humans by manipulating the central nervous system (see Figure 2), therefore it can serve as a source of natural case studies of how and why the hypotheses of organizational neuroscience are useful in studying organizational processes and employees’ as well as managers’ decision-making. So far such specific studies have not been conducted, although using the paradigm of a mind-affecting parasite does not share the methodological limitations for which organizational neuroscience is frequently criticized

(Ashkanasy, Becker, & Waldman, 2014; Butler, O’Broin, Lee, & Senior, 2016; Cropanzano & Becker, 2013; Lindebaum & Jordan, 2014).

[T]here seem to be four main issues of contention. The first is a fear of reductionism, that organizational neuroscience seeks to reduce organizational behavior to activity in particular brain regions or even neurons... Second, there are legitimate concerns with limitations of the methods and technologies that underlie neuroscience research... The third issue is that... practical applications of neuroscience may be inappropriate or meaningless, and the potential for application to issues beyond individuals (e.g., team-based phenomena) is non-existent... The fourth and final issue we address is that some applications of neuroscience... have all the characteristics of (yet) another management fad. (Ashkanasy, Becker, & Waldman, 2014, pp. 898-899)

First, the parasite affects the neural and hormonal systems directly, therefore it’s necessary to use reductionist, “mechanistic” physiological explanations of perception, decision-making and behavior in studying its impact on human behavioral patterns. Nevertheless, the infected people remain at their workplaces, in everyday situations instead of artificial laboratory experiments. We can therefore apply predictions from the mechanistic/physiological explanations to actual behavior of employees in firms. As *Toxoplasma* alters primarily cognitive and personality characteristics and so relationships of the affected individuals with other people are affected too. The effects of infection are connected to teamwork and organizational management, not just decisions and behavior of an individual, as is typical for neuroscience laboratory studies. Third, if the parasite’s influence is truly genuine, in some cases more so than in others, then knowledge of its impacts enriches the organizational behavioral theory and possesses highly practical insights for human resources management

and organizational management in general. Finally, although *Toxoplasma* infection generally affects people negatively, under some circumstances it can also have a positive impact (e.g. more pronounced extraversion of *Toxoplasma*-positive people, as extraversion predicts higher status in team contexts (DesJardins, Srivastava, Küfner, & Back, 2015)), and so it could enable organizational scholars to observe the selection of *Toxoplasma*-infected individuals with induced change of personality to specific organizational positions or roles.

Furthermore, due to a possibility that the parasite affects the forms of human cultures and economic institutions as well (Lafferty, 2006; Maseland, 2013), the findings about the parasite could be also used in the field of inter-cultural or international management (*T. gondii*, as this article will show, can cause “carpe diem personality” in infected persons and toxoplasmosis is quite widespread e.g. in France).

While all these research propositions seem to be long shots (and some of them truly are just speculations, as I highlight later in the review), I believe that in the area of organizational neuroscience it is true “that a study of latent toxoplasmosis... has its best years ahead” (Flegr, 2013a, p. 161). Moreover, the findings can also be used in general research on decision-making errors and biases of managers.

Yet, methodological and ethical problems prevail in this paradigm as well. Firstly, it’s not possible to infect humans in randomized experiments. Therefore, most evidence of toxoplasmosis’ influence on human personality and cognition is of a correlational nature and bearing the risk of spurious relationships. Secondly, although the effects of toxoplasmosis are not pathological, the latent infection is chronic, typically incurable in people. The disease can create a stigma in infected persons and lead to their discrimination.

The article next presents some basic information on the protozoan parasite *Toxoplasma gondii* and its physiological mechanisms that affect the hosts. The first part of the systematic review of toxoplasmosis' influence on humans is focused on changes in cognitive abilities of the infected people and the possible impacts of their impaired cognition on their jobs. The second part of the review concerns permanent changes in personality characteristics and traits (as conceptualized by the five-factor model (Goldberg, 1990)) or appearance, which the infected people may undergo. It is speculated how toxoplasmosis may influence work performance and careers of infected employees through the changes of personality traits. This section is followed by a short speculation on the possible influence of the parasite on cultures. The conclusion shows the limitations of the presented inferences and possible future courses of research of *Toxoplasma*'s impact on organizational dynamics.

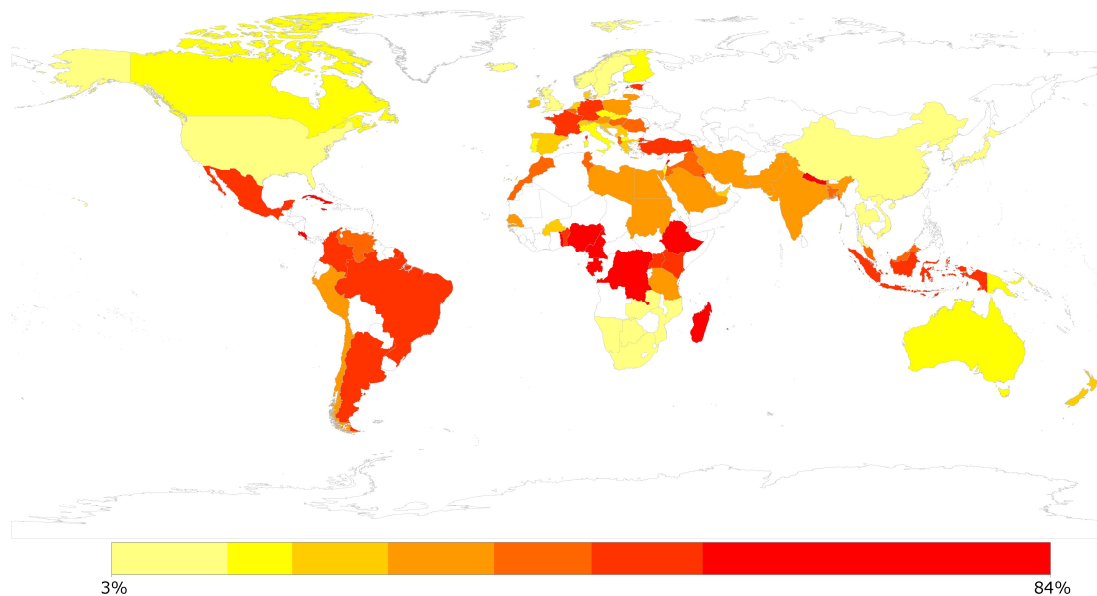
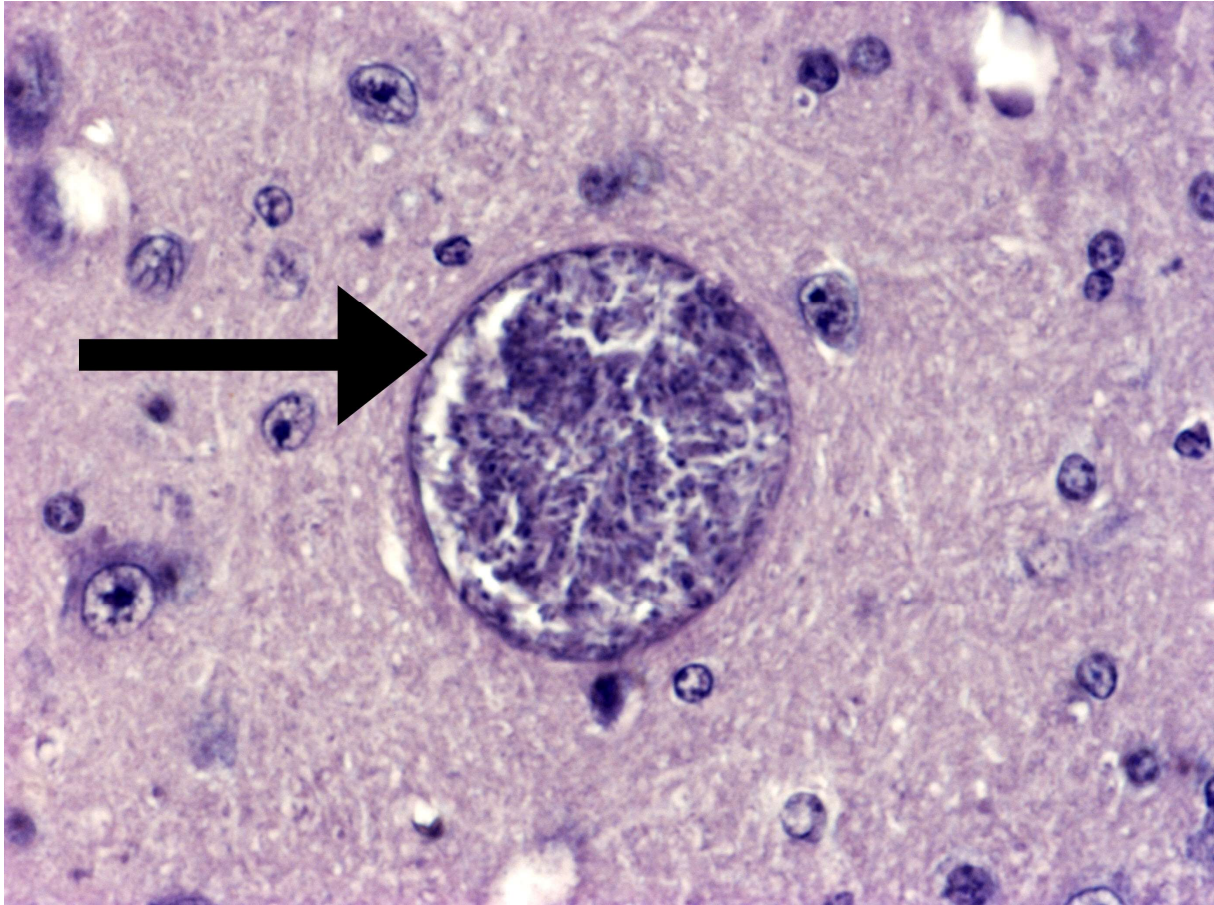


Figure 1. Prevalence of toxoplasmosis (seroprevalence) per country in % of population; there is no data for the countries that are not shaded in the map. The source of country level statistics is (Flegr & Dama, 2014). Toxoplasmosis is typically diagnosed by serological tests, which measure levels of antibodies – immunoglobulin G (IgG) or immunoglobulin M (IgM), in the blood of the tested people. Most of the seroprevalence data comes from women in childbearing age (the seroprevalence is therefore adjusted to a standard age of 22 years). Nevertheless, the seroprevalence reported in the epidemiological literature varies enormously (Chemoh et al., 2013), and in many countries it is now dramatically decreasing, possibly due to a shift in hygiene habits.



*Figure 2. A Toxoplasma's tissue cyst in the brain of a chronically infected mouse (width of the cyst is about 50 μ m; small darker bodies around the cyst are brain cells). Printed by permission of Jaroslav Flegr ©. During its life cycle, *Toxoplasma gondii* converts into various stages with different morphology. There are many *Toxoplasma* strains, but the majority in the USA and Europe falls into three distinct lineages (Saeij, Boyle, & Boothroyd, 2005).*

6.2 *Toxoplasma gondii*, The Master

The objective of *Toxoplasma* is to make its way from its natural intermediate hosts – rodents (and other warm-blooded animals) to its final hosts – cats and other felines. Only in the digestive system of cats can the parasite sexually reproduce and spread out through their excrement. If an intermediate host is infected by *Toxoplasma*, the parasite quickly reproduces asexually and its oocytes settle in the brain and other tissues and begin altering the host's behavior. These manipulations are sometimes very specific – for example infected rats are no longer afraid of cat odor, but they don't lose fear of other predatory species (Lamberton, Donnelly, & Webster, 2008). Other manipulations are straightforward: the reaction time of

infected animals increases; vigilance and motor activity deteriorate. Nonetheless the infected rats show further risky behavior (Webster, 2007). The success rate of a cat to catch a rat increases drastically, which means that *Toxoplasma* reaches its final destination, where it sexually reproduces, faster, and the cycle repeats. The power of manipulation of hosts increases with the length of the infection, indicating a causal influence of the parasite on the changes of its intermediate host's behavior. They could not be merely the side effects of an acute infection, which would rather induce a more pronounced behavioral change at the beginning. It cannot be ruled out completely that the manipulation by the parasite is a wide-ranging consequence of a chronic disease – tissue destruction and the host's immune system activity (Flegr, 2013a). Nevertheless, Webster, Lamberton, Donnelly, & Torrey (2006) showed also that anti-parasite medications are efficient in preventing related behavioral alterations (moreover, medications used to treat psychiatric diseases possess anti-parasitic properties too).

Any warm-blooded animal can be infected by *Toxoplasma*, including humans. The infection is most frequently contracted by consuming poorly washed vegetables or fruits from places contaminated with feline excrement, direct contact with the excrement, or consuming insufficiently cooked meat of infected animals, for example pork, lamb or turkey. That may be the reason why countries with a tradition of eating undercooked meat have a higher prevalence of toxoplasmosis (as well as countries with more people working in agriculture, poor hygienic standards and cats as frequent pets).

After a short, flu-resembling acute stage, the infection quickly enters the latent stage characterized by the permanent presence of the parasite's cysts in muscle and central nervous system. The chronic disease is seemingly asymptomatic in most people. Serious health

complications are rare and can appear especially in prenatal infections (a congenital infection can cause miscarriage or severe impairments in the newborn) or in patients with weakened immunity, either by HIV/AIDS or by taking an immunosuppressant after an organ transplantation.

Toxoplasma cannot “recognize” in which host it is present, its manipulation therefore affects behavioral patterns not only in rodents but also in its unnatural hosts, including humans (Webster, et al., 2013). For example, infected men rate the smell of cat urine as more pleasant than the uninfected individuals (Flegr, Lenochová, Hodný, & Vondrová, 2011).

6.3 Physiological Mechanisms of Manipulations

Cysts containing *Toxoplasma* are distributed relatively randomly across the brain (but see (McConkey, Martin, Bristow, & Webster, 2013)); in rodents especially in olfactory bulbs, amygdala, nucleus accumbens, cerebral cortex, cerebellum, medulla oblongata, basal ganglia, septohippocampal and perihippocampal regions (Webster & McConkey, 2010). Cysts can cause direct neurodegeneration (see similar effects by cytomegalovirus, Novotná et al. (2005)), but these pathological processes alone are unlikely to be responsible for the observed behavioral changes. This is because important behavioral characteristics are left intact, except for the observed specific behavioral alterations.

The placement of the cysts in the olfactory bulbs and in the amygdala is not surprising because the change in the perception of cat odor is a common manipulation of *Toxoplasma*; and because the amygdala handles, inter alia, stimuli that cause fear. Similarly, a strong candidate for the location of the parasite in the brain of a host is the nucleus accumbens, which has demonstrated a role in the breadth of behaviors regarding rewards, expectations, pleasure and fear (Cauda et al., 2011). However, any direct effect of the parasite in the

selected regions relies on the premise that parasites can locate these regions and then implement their manipulation with surgical precision – which does not seem probable. The handling mechanism is rather an indirect neurotransmitter modulation. *Toxoplasma* causes chemical changes in its immediate surroundings and thereby it influences certain neurons playing a role in the “targeted” behavior. Thus it can strengthen or weaken certain neuronal pathways and make some physiological and behavior effects more likely than others (Webster & McConkey, 2010).

The parasite can change the concentration level of the neurotransmitter dopamine in the brain by local inflammation of certain neuronal areas. This was observed in mice physiologically and indirectly in humans. Infected people are characterized by reduced novelty-seeking (Flegr et al., 2003; Skallová, Kodym, Frynta, & Flegr, 2006), which is a personality trait significantly associated with dopaminergic system (Cloninger, Svrakic, & Przybeck, 1993). Moreover, the genome of *Toxoplasma* also contains genes for key enzymes of dopamine synthesis (Gaskell, Smith, Pinney, Westhead, & McConkey, 2009). Because there is no simple explanation why *Toxoplasma* should have similar enzymes for itself, it means that the parasite uses these enzymes and is able to induce a release of dopamine into tissue of the hosts to manipulate them (Prandovszky et al., 2011). Dopamine is involved in behavior related to getting rewards and avoiding loss, impulsivity, learning, novelty seeking or risk taking (Jocham, Klein, & Ullsperger, 2011; Pine, Shiner, Seymour, & Dolan, 2010; Sharot, Shiner, Brown, Fan, & Dolan, 2009). These characteristics undoubtedly have their effects in many aspects of organizational life.

The impact of the infection could be significant with regard to outbreaks of several neurological and psychiatric diseases associated with a biased function of the dopaminergic

system. For example, having toxoplasmosis was found to increase the risk of schizophrenia 2.7 times, which is approximately equal to the increased risk of a cannabis user (Torrey, Bartko, & Yolken, 2012). The influence of toxoplasmosis was even identified at the onset of personality disorders, Parkinson disease, Alzheimer disease, obsessive-compulsive disorder, recurrent migraines, autism, brain tumors, and even depression; for reviews see (Flegr, 2013a; Webster, et al., 2013). The rate of prevalence of toxoplasmosis is correlated with the countries' suicide rates (Ling, Lester, Mortensen, Langenberg, & Postolache, 2011), women infected with toxoplasmosis are twice as likely to commit or attempt suicide than uninfected women (Pedersen, Mortensen, Norgaard-Pedersen, & Postolache, 2012). This effect is concentrated closer to the moment of infection (it doesn't intensify with the duration of infection), so it appears to be an immediate reaction rather than a cumulative impact of latent disease.

A wide variety of mentioned psychiatric disorders are associated with depressive states, showing the possible effect of *Toxoplasma* on the metabolism of serotonin too. Serotonin is synthesized from tryptophan, an amino acid that is a basic nutrient for many parasites, including *Toxoplasma*. Stemming from this, depression could be thus caused by a starving parasite (Flegr, 2013a), but see also (Healy, 2015). *Toxoplasma* may thus worsen infected employees' life satisfaction and there is no doubt that employees' psychological well-being influences their work-related outcomes heavily (Luthans & Youssef, 2007; Youssef & Luthans, 2007).

Toxoplasmosis may also affect testosterone levels. *Toxoplasma*-positive men have a higher concentration of testosterone and *Toxoplasma*-positive women have a lower concentration of testosterone than *Toxoplasma*-free controls (Flegr, Lindová, & Kodým, 2008). The opposite

direction of the testosterone shift in both genders can explain the observed gender specificity of behavioral and personal alterations in *Toxoplasma*-positive participants (see more in the following sections). The reason for these results could be the immunosuppressive nature of testosterone too, whereby men possess a generally higher probability to be infected. On the other hand, a study (Lim, Kumar, Hari Dass, & Vyas, 2013) showed that *Toxoplasma* infection enhances expression of genes involved in facilitating synthesis of testosterone, resulting in greater testicular testosterone production in male rats. The same mechanism could work also in humans.

6.4 How Do the Puppets Behave? Effects on Cognition and Working Memory

A manager's performance (as in most workers) is undoubtedly related to their mental abilities (Teece, 2007; Eggers & Kaplan, 2013). General cognitive abilities largely predict both academic and occupational level attained and work performance, and do so better than any other trait or disposition (Kuncel, Hezlett, & Ones, 2004; Schmidt, & Hunter, 2004). It's not surprising that a third to half of CEOs are on the top 1% of cognitive abilities (Wai, & Rindermann, 2015). Current research on cognitive ability and performance in the workplace focuses on finding out which emotional and cognitive processes – such as bounded attention and perception, memory, and problem solving – are active in managerial and strategic decision-making or which (un)successful “cognitive climates” are prevalent within organizations (Hodgkinson & Healey 2011; Baron, 2006; Foss, & Lindenberg, 2013; Houdek, 2016).

Although there aren't many studies on the impact of toxoplasmosis on job-related cognition, published studies thoroughly confirm that even in humans, toxoplasmosis generally impairs basic cognitive functions. The infected humans aren't in danger of being caught by a cat,

obviously, though their slower reactions can cause death or injury as well. Several studies have shown that *Toxoplasma*-positive people are more likely to suffer a traffic accident. Among the victims of workplace accidents, there is a greater proportion of people infected with toxoplasmosis too. This latter relationship was demonstrated only in small subsamples of workers from a low social class, so a generalization of these findings remains questionable (see a systematic review in Table 1). The preferred explanation of the results is that the negative impacts of toxoplasmosis will mainly be manifested in already prone groups or situations and/or contexts where the basal cognitive strength is weak (similarly, as there is more frequent and earlier manifestation of Alzheimer's disease in people with low cognitive reserves (Stern, 2009)).

Just like mice, infected humans have slower reactions. In a simple double-blind experiment (Havlíček, Gašová, Smith, Zvára, & Flegr, 2001), the first of its kind, participants had to press a designated key as quickly as possible after a certain shape appeared on the screen. In the first minute of the experiment, there wasn't any difference in the speed of reaction between infected and uninfected participants. After the first minute, the infected people started getting significantly slower, which suggests that *Toxoplasma* weakens long-term ability to concentrate. Most other studies also indicate that infected people are more easily tired or not able to concentrate on longer-lasting tasks (see Table 1).

Out of the above-stated 22 studies, 12 found a negative influence of toxoplasmosis on various cognitive functions, 6 only in certain subgroups of subjects, and 4 either found no effect, or an opposite effect. However, a majority of studies are conducted in convenience samples and test multiple variables or their rather flexible operationalizations, and thus could bear a large risk of false positives (Bettis, 2012; Simmons, Nelson, & Simonsohn, 2011). (On the other hand,

as I'll show later, there exists some suspicion that *Toxoplasma* increases testosterone levels and thus also competitiveness in men, therefore many tests' results can be skewed away from identifying negative influence of toxoplasmosis on cognition in men in the competitive environment.)

The results presented in this section show that *Toxoplasma*-positive people have longer reaction times, they are more easily distracted from their long run tasks and their working memory is worse. The infection appears to be linked with recklessness. Good working memory and ability to exercise cognitive control are of course crucial for predicting job performance on a number of measures (Ackerman, Beier, & Boyle, 2005; Tang & Posner, 2009). It is expected that during prolonged tasks that require concentration, infected people will achieve worse outcomes than uninfected individuals.

Nevertheless, the correlative nature of the analyses allows the interpretation that certain unfavorable socio-economic conditions are related to both low cognitive abilities and a higher risk of being infected with toxoplasmosis (such as eating unwashed vegetables or uncooked meat, living in the countryside, etc.). The association between infection and cognitive deficits is usually weaker or even disappears when the covariates of age, socioeconomic status, and gender etc. are controlled for. Cross-section surveys, however, cannot exactly show whether toxoplasmosis has a direct impact on cognition or not (although there is strong evidence that the difference in personality traits between infected subjects and controls increases with time that passed from the moment of infection; see below). The relationship between cognition and toxoplasmosis is reversible and modulated by many other factors – low socioeconomic status can lead to cognitive difficulties (Mullainathan & Shafir, 2013) and a higher risk of being

infected with toxoplasmosis, or infection can lead to cognitive difficulties and subsequent low social status.

6.5 Changes of Personal Characteristics and Physical Appearance

Management research has shown that in organizational practice, people with different personality profiles hold different beliefs and react differently to work challenges (George, 1992, Raja, Johns, & Ntalianis, 2004). The first large metaanalysis (Barrick & Mount, 1991), whose results have been corroborated by subsequent metaanalyses (Judge, Higgins, Thoresen, & Barrick, 1999; Judge, Heller, & Mount, 2002), used a five-factor model (Goldberg, 1990), which has a long influential history of explaining organizational behavior and will also be partly used below in a demonstration how toxoplasmosis may impact the discussed personality traits in humans. Barrick and Mount's study has found that the trait of conscientiousness – thus a persistent, planful, responsible, and hardworking personality – consistently positively correlates with various indices of a worker's productivity (job proficiency, training proficiency and personnel data) across different professions. Furthermore, the trait of extraversion – thus a sociable, gregarious, assertive personality craving reward and status – influenced productivity in positions with substantial social interactions, such as managers and sales. Extraversion and conscientiousness are also the strongest predictors of leadership (Judge, Bono, Ilies, & Gerhardt, 2002). The personality construct “openness to experience” correlated with performance in training proficiency, but not anywhere else. Openness to experience, however, is strongly related to innovation and creativity of workers and with intrinsic motivation not only at workplaces (George & Zhou, 2001; Shalley, Zhou, & Oldham, 2004).

Conversely, neuroticism, thus a personality manifesting emotional instability, anxiety, and lack of psychological adjustment correlates positively with dissatisfaction at work, low

productivity and inability to lead (Judge, Higgins, Thoresen, & Barrick, 1999; Judge, Heller, & Mount, 2002).

As shown in a systematic review in Table 2, out of the above-stated 15 studies, 14 found some influence of toxoplasmosis on various personality traits, only one (large) study found no effect (again, a number of studies bear a large risk of false positives). The personality characteristics of infected individuals change, and the impact generally becomes more severe the longer they are infected, so it is unlikely that subjects with certain personality profiles are more prone to *Toxoplasma* infection (nevertheless, without human infection experiments – which are clearly unethical – it is not possible to decide whether a genuine causal relation exists between *Toxoplasma* infection and personality and other changes). However, there are disparities in the findings and toxoplasmosis explains generally only a small part of the variability.

For example, Skallová et al. (2005) found that *Toxoplasma*-positive participants, both men and women, had lower scores in the psychobiological factor novelty seeking than *Toxoplasma*-free participants. Infected subjects also have little or no need for novel stimulation, and prefer familiar places, people, and situations; results largely confirming results obtained by Flegr et al. (2003). Also, *Toxoplasma*-positive subjects scored significantly lower in the test of verbal intelligence than *Toxoplasma*-free subjects (nevertheless, this characteristic might be explained by different background of infected and not infected individuals). As indicated earlier, lower novelty seeking is expected to be associated with an increased concentration of dopamine in the brain tissue, a product of the increased synthesis of dopamine due to *Toxoplasma* tissue cysts. These studies also show that *Toxoplasma*-positive subjects tend to be more organized, methodical, and prefer activities

with strict rules and regulations. Contrary to that, Lindová et al. (2012) observed lower conscientiousness in *Toxoplasma*-infected subjects, particularly in men. The relationship between the pathogen and conscientiousness-related traits is thus unclear.

Moreover, *Toxoplasma*-infected male and female subjects showed higher extraversion in comparison with *Toxoplasma*-free subjects. *Toxoplasma*-infected men tend to be suspicious and jealous, they break the social rules more often, and they suffer from low superego strength, but these results are not consistent across studies. As personal qualities significantly influence workplace relations, leadership, and management skills as well as teamwork performance (Barrick, Stewart, Neubert, & Mount, 1998; Bradley, Klotz, Postlethwaite, & Brown, 2013), one should expect that the changes of personality characteristics (or altered levels of them) may also be reflected in corporate practice.

The exact impact of the infection on work performance or career growth is complex to predict since it is demonstrated on many levels. Moreover, personality traits or individual skills are linked to their respective organizational contexts too, and their dis/advantageousness may depend on the situational conditions, tasks and team composition (however, a further discussion of the topic would be out of the scope of this article). For example, toxoplasmosis increases extraversion (i.e. social dominance and sociability), which would be particularly beneficial for sales, managers or team leaders, but then on the other hand it reduces cognitive abilities and willingness to try new things. As it was proven that leadership skill correlates with extraversion even more than with intelligence (Judge, Bono, Ilies, & Gerhardt, 2002; Judge, Colbert, & Ilies, 2004), the net impact of toxoplasmosis could be positive for a manager or a leader. Since toxoplasmosis lowers conscientiousness, we can speculate that infected people would more frequently fail at their tasks, so that their career dynamics would

look like “shine and burn out”. *Toxoplasma*-infected managers can also lower work satisfaction and productivity of subordinates because of their negligence or lack of coherent managing system. Infected team members could limit the performance of the whole team.

The unique questionnaire Toxo94, based on a pilot study conducted by Flegr (2010), uncovered even more specific differences between *Toxoplasma*-positive and negative individuals. For example infected men and women were more likely to agree with the statements: “My instinctive (reflexive) behavior under imminent danger is rather slow and passive. In a situation where most people get alarmed and instinctively jump aside, I am slow to react. When a car horn honks at me, I tend to do nothing, although in danger, and to let it run over rather than to run under the wheels of another car,” and “I believe that some people have the power to impose their will on others under hypnosis or otherwise.” *Toxoplasma*-positive men also agreed more with the statement: “When I am attacked, physically or otherwise, or when I should fight for something important, I stop fighting at that moment. It is not a result of a rational decision not to fight, as in fact I know that I should continue fighting and I would like to do so, but my own sub-consciousness betrays me and I lose the will to fight back.”

The cited statements have many complex meanings, conclusions gained from these questionnaires are therefore questionable from the psychometric point of view. Despite that, I would speculate that *Toxoplasma*-positive people may manifest paranoid notions about processes in organizations and consequently fall victim of abusive supervision (Chan & McAllister, 2014). As noted by De Vries & Miller (1986, p. 271): “...feelings of guilt, worthlessness, and inadequacy are pervasive. Individuals downgrade themselves; they are self-deprecating, and feel inferior to others, claiming a lack of ability and talent. They

abdicate responsibility. A sense of helplessness and hopelessness prevails. External sources for sustenance are needed to combat insecurity.”

6.6 Toxoplasma, Testosterone, and Dominance

In studying the impact of personality characteristics on workplace behavior, leadership and productivity, organizational neuroscience can use even the quite specific influence of toxoplasmosis on the production of the sex hormone testosterone. Its impacts on personality characteristics, respectively decision-making and behavior, or appearance are well-documented.

Some studies identified that *Toxoplasma*-positive men had higher testosterone levels than non-infected men (Flegr, et al., 2008; Zghair, AL-Qadhi, & Mahmood, 2015). Infected women on the other hand had lower levels of the hormone (but see Shirbazou, Abasian, & Meymand, 2011). High levels of testosterone have been closely linked to perceived social status (Eisenegger, Haushofer, & Fehr, 2011). It plays a significant role in willingness to take risks, leadership and entrepreneurship (Apicella et al., 2008; Brañas-Garza & Rustichini, 2011; Garbarino, Slonim, & Sydnor, 2011) and, based on other evidence, also in impulse control, an increase in planning and executive abilities (Dreber, Gerdes, Gränsmark, & Little, 2013) or in willingness to engage in antisocial and/or corrupt behavior (Bendahan, Zehnder, Pralong, & Antonakis, 2015). High levels of testosterone are also negatively related to the accuracy with which people infer the thoughts and feelings of others (Ronay & Carney, 2013).

Toxoplasma-positive men also appear more masculine and dominant to women (Hodková, Kolbeková, Skallová, Lindová, & Flegr, 2007). It could be important to just *appear* authoritative and convincing for a person who wants to be a successful leader, motivate

employees or deter competitors, rather than to actually possess such personality traits, because specific physical traits are robustly associated with aggressive and self-interested behavior (Haselhuhn, Wong, Ormiston, Inesi, & Galinsky, 2014; Spisak, Homan, Grabo, & Van Vugt, 2012). Studies have confirmed that managers who have specific facial features indeed have higher salaries and work for more successful companies (Rule & Ambady, 2008; Wong, Ormiston, & Haselhuhn, 2011). Manipulative effects of *Toxoplasma* are related to an increase of facial masculinity and thus the results of infection can be observed also in this matter.

In the case of testosterone, there are two contradicting effects of *Toxoplasma* on behavior and hence the final impact is difficult to predict. For example, a better performance (in the sense of higher profitability) of a broker depends on their higher level of testosterone (Coates & Herbert, 2008), which is boosted by *Toxoplasma*, but as the disease also slows down reaction times, the real-life influence would be mixed. In summary, we can again speculate that *Toxoplasma*-positive people can achieve high positions, however, their performance may decline due to the decrease in conscientiousness, increased neuroticism and possible health risks. Because of the tentative different effect of toxoplasmosis on testosterone in men (increased levels) and women (decreased levels), it's even possible that toxoplasmosis may be a partial culprit in the inequality in leading positions in men and women (see the next section for more information on toxoplasmosis and gender work roles).

I believe that toxoplasmosis offers an inspiring variable in the psychological and neuroscientific model of the effects of personality, cognitive traits and even physical appearance on human capital building and thus on organizational outcomes. It can help improve identification methods in research of the impact of personality characteristics on career outcomes and on teams' and firms' inner working (Borghans, Duckworth, Heckman, &

Ter Weel, 2008; Daly, Harmon, & Delaney, 2009; Heckman, 2011). If it is true that the parasite gradually and significantly alters certain aspects of personality characteristics by manipulation of neural and hormonal systems of humans, it should be possible to observe differences in decision-making and actions of infected employees and managers in the organizational environment compared to those not infected.

These observations should be identifiable on levels of firms, regions, states or countries with different prevalence of toxoplasmosis, as it itself varies significantly between nations and within countries (e.g. in the US age-adjusted seroprevalence is higher in the Northeast (29.2%) than in the South (22.8%), Midwest (20.5%), or West (17.5%) (Jones et al., 2001)).

6.7 Inter-cultural Management

A higher proportion of people infected with toxoplasmosis in the population is associated with stronger neuroticism on a national level (Lafferty, 2006). Lafferty also shows associations between prevalence of toxoplasmosis and uncertainty avoidance and masculine sex roles, however, these results were not robust. So, there is a possibility that not only various cultural dimensions alter individual personality through situational or educational conditioning and/or experience, but an aggregate national personality might be created through the collective behavior of individuals with a specific personality (Hofstede & McCrae, 2004). The same way that infected individuals systematically show evidence of certain personality characteristics, nations where toxoplasmosis is more frequent demonstrate these same tendencies as well. What are the characteristics of nations with higher prevalence of toxoplasmosis? Lafferty concludes:

Individuals in populations that are ‘masculine’ in the sex-role cultural dimension reinforce traditional gender work roles, gender differentiation, and

have a higher focus on ego, ambition, money, material possessions, self-achievement and work than on relationships, people, social support and quality of life. Individuals in populations that rate high in the cultural dimension of uncertainty avoidance feel threatened by uncertain or unknown situations, leading to a rule oriented society geared to reduce uncertainty. (2006, p. 2753, inner references omitted).

However, similar cross-country analyses suffer from a strong endogeneity problem in the causality direction, and in operating variables (moreover, the associations between personality shifts and *Toxoplasma*-infected individuals differ between men and women). Nevertheless, after careful controlling for determinants of the prevalence of toxoplasmosis in the population, such as climate, urbanization, level of sanitation, the consumption of meat, and religion (in some countries religions promote vegetarianism and toxoplasmosis is rare there), the prevalence of *Toxoplasma* may be a suitable instrument for monitoring the impact of cultural patterns on organizations' inner working, business practices or economics institutions (Maseland, 2013). Thus, it might help to explain a huge variation in management practices across organizations in different countries (Bloom, Genakos, Sadun, & Van Reenen, 2012). As the prevalence of toxoplasmosis is high even in some developed countries (its prevalence is largely independent from economic well-being of nations), it can be used to decrease the risk of misidentifying the influence of other biological factors on economic, cultural, or business variables (Bonds, Dobson, & Keenan, 2012).

Research focusing on whether varying prevalence of toxoplasmosis within a country can explain the specifics of regional (business) cultures would be methodologically purer and more useful. This data, however, is lacking in the present.

6.8 Conclusion

The presented review suggests that *Toxoplasma*-positive individuals have specific personality characteristics compared to the non-infected population, and that such differences could be caused by physiological manipulation by the parasite, though in some cases there is still a probability that certain groups of people have a higher likelihood of getting infected. *Toxoplasma*-positive individuals have slower reaction times, they are more easily distracted and their working memory is worse. *Toxoplasma* may decrease an individual's life satisfaction. Infected people more often believe that their instinctive behavior under imminent danger is rather slow and passive, and that some people have the power to impose their will on others. They also believe that when they are attacked, they stop fighting because their own sub-consciousness betrays them. Infected men have higher levels of testosterone and their physical appearance is portrayed as more masculine and dominant. *Toxoplasma* thus could offer a suitable model for research of influence of personality traits and cognitive skills on individual work performance and on organizational outcomes. At present, however, there is no study that had investigated the effects of toxoplasmosis in the context of an organizational environment.

Utilization of the *Toxoplasma* model in organizational neuroscience (or in organizational research in general) certainly has several limitations. Even though some impacts of the disease on physiological mechanism of dopamine, serotonin or testosterone have been demonstrated, further research on exactly which chemical and physiological processes *Toxoplasma* manipulates its human victims by is only at its beginning. For example, manifestation of the disease depends on the RhD blood group (Novotná et al., 2008). Based on a recent study (Hari Dass & Vyas, 2014), *Toxoplasma* is able to cause specific epigenetic changes in medial amygdala circuits. Amygdala circuits are, inter alia, responsible for the

sexual behavior of animals: as it seems, cats are no longer perceived as threat for an infected rat, but become a sexually attractive stimulus. Furthermore, Tan et al. (2015) showed that infection with *Toxoplasma* increases the propensity of the infected rats to make more impulsive choices. Their study concludes: “*T. gondii* infection... represents a behavioural syndrome consisting of reduced innate fear, increased sexual attractiveness and greater delay aversion; all hallmarks of a ‘carpe diem’ animal personality” (Tan, et al., 2015, p. 5). As of now there is no study that had tested the parasite’s impact on sexual and/or mating behavior of humans. Although this is just a speculation, toxoplasmosis could influence the quality of relationships between men and women in workplaces or the prevalence of sexual harassment in firms (as infected men have higher testosterone levels and infected women tend to exhibit more warmth).

It is not evident how exactly, or whether toxoplasmosis influences several other personality traits such as creativity, selfishness, dis/honesty, personal integrity, dark triad personality traits (narcissism, machiavellianism and psychopathy) etc. It can also be expected (as many of the cited studies indicate) that with control on covariates like personal background, demographics, education or training, the effects of the parasite on personality are not that strong, especially not in the corporate environment. Also, the reviewed literature presents some contradictory findings, where some of them could be false positives due to publication bias. More replications of relevant studies are necessary (see Byington, & Felps, 2016, for a more general review of credibility crisis in management sciences).

Research in behavioral demonstration of toxoplasmosis’ impacts also uses specific groups of participants (usually students, seniors, pregnant women, and soldiers), which makes it difficult to generalize the findings for the general population or particularly for the business

world (although this issue is common in neuroscientific research). Used psychological and cognitive tests are relatively context-specific, and in most cases questionnaire-based with absence of real incentives or trade-offs. It is not possible to predict how the proposed findings would end up in the high-stakes, multi-tasking environment of firms.

Obviously, there are ethical problems as well (Lindebaum, 2013), for example that *Toxoplasma*-positive people could be discriminated when their infection becomes known. Nevertheless, realization of one's own infection should primarily lead to higher awareness of systematic biases and tendencies that are connected to toxoplasmosis. Mindfulness training or cognitive behavioral therapy sessions would be advisable for some infected individuals. Adversely, if people knew about their disease and outcomes connected with it, it could make them adopt "an infected identity" and they could start inadequately rationalizing their own mistakes, failures, and lapses (Dijksterhuis & van Knippenberg, 1998; but see also Vranka & Houdek, 2015). Another open question is whether toxoplasmosis should be treated as a pre-existing condition in the realm of legal matters (insurance, health, tort and criminal law, etc.).

There are many other microorganisms that can affect some aspects of the human mind and/or behavior (Kramer & Bressan, 2015), e.g. the cytomegalovirus may alter the personality of infected subjects (Novotná, et al., 2005), gut bacteria may play a role in anxiety and depression (Mayer, Knight, Mazmanian, Cryan, & Tillisch, 2014), or in processing emotions and sensations (Tillisch et al., 2013). There is even a (small) possibility that the influenza virus could modify human social behavior before the onset of symptoms (Reiber et al., 2010). Future studies should verify the robustness of these observed effects and investigate their relevance to organizational and management research.

6.9 References

- Ackerman, P. L., Beier, M. E., & Boyle, M. O. (2005). Working Memory and Intelligence: The Same or Different Constructs? *Psychological Bulletin*, 131(1), 30-60. doi: 10.1037/0033-2909.131.1.30
- Alvarado-Esquivel, C., Pacheco-Vega, S.J., Hernández-Tinoco, J., Sánchez-Anguiano, L.F., Berumen-Segovia, L.O., Rodríguez-Acevedo, F.J.I., . . . Güereca-García, O.A. (2014). Seroprevalence of *Toxoplasma gondii* infection and associated risk factors in huicholes in Mexico. *Parasites & Vectors*, 7(1), 1-7. doi: 10.1186/1756-3305-7-301
- Alvarado-Esquivel, C., Torres-Castorena, A., Liesenfeld, O., Estrada-Martínez, S., & Urbina-Álvarez, J. (2012). High seroprevalence of *Toxoplasma gondii* infection in a subset of Mexican patients with work accidents and low socioeconomic status. *Parasites & Vectors*, 5(1), 1-6. doi: 10.1186/1756-3305-5-13
- Apicella, C. L., Dreber, A., Campbell, B., Gray, P. B., Hoffman, M., & Little, A. C. (2008). Testosterone and financial risk preferences. *Evolution and Human Behavior*, 29(6), 384-390. doi: 10.1016/j.evolhumbehav.2008.07.001
- Ashkanasy, N. M., Becker, W. J., & Waldman, D. A. (2014). Neuroscience and organizational behavior: Avoiding both neuro-euphoria and neuro-phobia. *Journal of Organizational Behavior*, 35(7), 909-919. doi: 10.1002/job.1952
- Baron, R.A. (2006). Opportunity recognition as pattern recognition: How entrepreneurs “connect the dots” to identify new business opportunities. *The Academy of Management Perspectives*, 20(1), 104-119. doi: 10.5465/amp.2006.19873412
- Barrick, M.R., & Mount, M.K. (1991). The big five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, 44(1), 1-26. doi: 10.1111/j.1744-6570.1991.tb00688.x
- Bendahan, S., Zehnder, C., Pralong, F. P., & Antonakis, J. (2015). Leader corruption depends on power and testosterone. *The Leadership Quarterly*, 26(2), 101-122. doi: 10.1016/j.leaqua.2014.07.010
- Beste, C., Getzmann, S., Gajewski, P. D., Golka, K., & Falkenstein, M. (2014). Latent *Toxoplasma gondii* infection leads to deficits in goal-directed behavior in healthy elderly. *Neurobiology of Aging*, 35(5), 1037-1044. doi: 10.1016/j.neurobiolaging.2013.11.012
- Bettis, R. A. (2012). The search for asterisks: Compromised statistical tests and flawed theories. *Strategic Management Journal*, 33(1), 108-113. doi: 10.1002/smj.975
- Bloom, N., Genakos, C., Sadun, R., & Van Reenen, J. (2012). Management Practices Across Firms and Countries. *The Academy of Management Perspectives*, 26(1), 12-33. doi: 10.5465/amp.2011.0077

- Bonds, M. H., Dobson, A. P., & Keenan, D. C. (2012). Disease Ecology, Biodiversity, and the Latitudinal Gradient in Income. *PLoS Biology*, 10(12), e1001456. doi: 10.1371/journal.pbio.1001456
- Borghans, L., Duckworth, A. L., Heckman, J. J., & Ter Weel, B. (2008). The economics and psychology of personality traits. *Journal of Human Resources*, 43(4), 972-1059. doi: 10.1353/jhr.2008.0017
- Bradley, B.H., Klotz, A.C., Postlethwaite, B.E., & Brown, K.G. (2013). Ready to rumble: How team personality composition and task conflict interact to improve performance. *Journal of Applied Psychology*, 98(2), 385-392. doi: 10.1037/a0029845
- Brañas-Garza, P., & Rustichini, A. (2011). Organizing effects of testosterone and economic behavior: Not just risk taking. *PLoS ONE*, 6(12), e29842. doi: 10.1371/journal.pone.0029842
- Butler, M. J. R., O’Broin, H. L. R., Lee, N., & Senior, C. (2016). How organizational cognitive neuroscience can deepen understanding of managerial decision-making: A Review of the recent literature and future directions. *International Journal of Management Reviews*, 18, 542-559. doi:10.1111/ijmr.12071
- Byington, E., & Felps, W. (2016). Solutions to the Credibility Crisis in Management Science. *Academy of Management Learning & Education*. doi: 10.5465/amle.2015.0035
- Cauda, F., Cavanna, A. E., D’Agata, F., Sacco, K., Duca, S., & Geminiani, G. C. (2011). Functional connectivity and coactivation of the nucleus accumbens: A Combined functional connectivity and structure-based meta-analysis. *Journal of Cognitive Neuroscience*, 23(10), 2864-2877. doi: 10.1162/jocn.2011.21624
- Chan, M.E., & McAllister, D.J. (2014). Abusive supervision through the lens of employee state paranoia. *Academy of Management Review*, 39(1), 44-66. doi: 10.5465/amr.2011.0419
- Chemoh, W., Sawangjaroen, N., Nissapatorn, V., Suwanrath, C., Chandeying, V., Hortiwakul, T., . . . Sukthana, Y. (2013). *Toxoplasma gondii* infection: What is the real situation? *Experimental Parasitology*, 135(4), 685-689. doi: 10.1016/j.exppara.2013.10.001
- Cloninger, C., Svrakic, D. M., & Przybeck, T. R. (1993). A psychobiological model of temperament and character. *Archives of General Psychiatry*, 50(12), 975-990. doi: 10.1001/archpsyc.1993.01820240059008
- Cook, T.B., Brenner, L.A., Cloninger, C.R., Langenberg, P., Igbide, A., Giegling, I., . . . Postolache, T.T. (2015). “Latent” infection with *Toxoplasma gondii*: Association with trait aggression and impulsivity in healthy adults. *Journal of Psychiatric Research*, 60, 87-94. doi: 10.1016/j.jpsychires.2014.09.019
- Cropanzano, R., & Becker, W. J. (2013). The promise and peril of organizational neuroscience: Today and tomorrow. *Journal of Management Inquiry*, 22(3), 306-310. doi: 10.1177/1056492613478518

- Daly, M., Harmon, C. P., & Delaney, L. (2009). Psychological and biological foundations of time preference. *Journal of the European Economic Association*, 7(2-3), 659-669. doi: 10.1162/jeea.2009.7.2-3.659
- De Vries, M.F.R.K., & Miller, D. (1986). Personality, culture, and organization. *Academy of Management Review*, 11(2), 266-279. doi: 10.5465/amr.1986.4282917
- DesJardins, N. M. L., Srivastava, S., Küfner, A. C. P., & Back, M. D. (2015). Who attains status? Similarities and differences across social contexts. *Social Psychological and Personality Science*, 6(6), 692-700. doi: 10.1177/1948550615580171
- Dijksterhuis, A., & van Knippenberg, A. (1998). The relation between perception and behavior, or how to win a game of Trivial Pursuit. *Journal of Personality and Social Psychology*, 74(4), 865-877. doi: 10.1037/0022-3514.74.4.865
- Dreber, A., Gerdes, C., Gränsmark, P., & Little, A. C. (2013). Facial masculinity predicts risk and time preferences in expert chess players. *Applied Economics Letters*, 20(16), 1477-1480. doi: 10.1080/13504851.2013.826861
- Eggers, J.P., & Kaplan, S. (2013). Cognition and capabilities: A multi-level perspective. *The Academy of Management Annals*, 7(1), 295-340. doi: 10.1080/19416520.2013.769318
- Eisenegger, C., Haushofer, J., & Fehr, E. (2011). The role of testosterone in social interaction. *Trends in Cognitive Sciences*, 15(6), 263-271. doi: 10.1016/j.tics.2011.04.008
- Ferreira, É.C., Marchioro, A.A., Guedes, T.A., Mota, D.C.G.A., Guilherme, A.L.F., & Araújo, S.M.d. (2013). Association between seropositivity for *Toxoplasma gondii*, scholastic development of children, and risk factors for *T. gondii* infection. *Transactions of The Royal Society of Tropical Medicine and Hygiene*, 107(6), 390-396. doi: 10.1093/trstmh/trt026
- Flegr, J. (2010). Influence of latent toxoplasmosis on the phenotype of intermediate hosts. *Folia Parasitologica*, 57(2), 81-87.
- Flegr, J. (2013a). How and why *Toxoplasma* makes us crazy. *Trends in Parasitology*, 29(4), 156-163. doi: 10.1016/j.pt.2013.01.007
- Flegr, J. (2013b). Influence of latent *Toxoplasma* infection on human personality, physiology and morphology: Pros and cons of the *Toxoplasma*–human model in studying the manipulation hypothesis. *The Journal of Experimental Biology*, 216(1), 127-133. doi: 10.1242/jeb.073635
- Flegr, J., & Dama, M. (2014). Does the prevalence of latent toxoplasmosis and frequency of Rhesus-negative subjects correlate with the nationwide rate of traffic accidents? *Folia Parasitologica*, 6, 485-494.
- Flegr, J., & Havlíček, J. (1999). Changes in the personality profile of young women with latent toxoplasmosis. *Folia parasitologica*, 46(1), 22-28.

- Flegr, J., & Hrdý, I. (1994). Influence of chronic toxoplasmosis on some human personality factors. *Folia parasitologica*, 41(2), 122-126.
- Flegr, J., Klose, J., Novotná, M., Berenreitterová, M., & Havlíček, J. (2009). Increased incidence of traffic accidents in *Toxoplasma*-infected military drivers and protective effect rhD molecule revealed by a large-scale prospective cohort study. *BMC Infectious Diseases*, 9(1), 1-7. doi: 10.1186/1471-2334-9-72
- Flegr, J., Kodým, P., & Tolarová, V. (2000). Correlation of duration of latent *Toxoplasma gondii* infection with personality changes in women. *Biological Psychology*, 53(1), 57-68. doi: 10.1016/S0301-0511(00)00034-X
- Flegr, J., Lenochová, P., Hodný, Z., & Vondrová, M. (2011). Fatal attraction phenomenon in humans—cat odour attractiveness increased for *Toxoplasma*-infected men while decreased for infected women. *PLoS Neglected Tropical Diseases*, 5(11), e1389. doi: 10.1371/journal.pntd.0001389
- Flegr, J., Lindová, J., & Kodým, P. (2008). Sex-dependent toxoplasmosis-associated differences in testosterone concentration in humans. *Parasitology*, 135(4), 427-431. doi: doi:10.1017/S0031182007004064
- Flegr, J., Novotná, M., & Lindová, J. (2008). Neurophysiological effect of the Rh factor. Protective role of the RhD molecule against *Toxoplasma*-induced impairment of reaction times in women. *Neuroendocrinology Letters*, 29(4), 475-481.
- Flegr, J., Preiss, M., & Klose, J. (2013). Toxoplasmosis-associated difference in intelligence and personality in men depends on their Rhesus blood group but not ABO blood group. *PLoS ONE*, 8(4), e61272.
- Flegr, J., Preiss, M., Klose, J., Havlíček, J., Vitáková, M., & Kodým, P. (2003). Decreased level of psychobiological factor novelty seeking and lower intelligence in men latently infected with the protozoan parasite *Toxoplasma gondii*. Dopamine, a missing link between schizophrenia and toxoplasmosis? *Biological Psychology*, 63(3), 253-268. doi: 10.1016/s0301-0511(03)00075-9
- Flegr, J., Zitková, Š., Kodým, P., & Frynta, D. (1996). Induction of changes in human behaviour by the parasitic protozoan *Toxoplasma gondii*. *Parasitology*, 113(01), 49-54. doi: 10.1017/S0031182000066269
- Foss, N.J., & Lindenberg, S. (2013). Microfoundations for strategy: A goal-framing perspective on the drivers of value creation. *The Academy of Management Perspectives*, 27(2), 85-102. doi: 10.5465/amp.2012.0103
- Gajewski, P. D., Falkenstein, M., Hengstler, J. G., & Golka, K. (2014). *Toxoplasma gondii* impairs memory in infected seniors. *Brain, Behavior, and Immunity*, 36, 193-199. doi: 10.1016/j.bbi.2013.11.019
- Gale, S. D., Brown, B. L., Erickson, L. D., Berrett, A., & Hedges, D. W. (2015). Association between latent toxoplasmosis and cognition in adults: a cross-sectional study. *Parasitology*, 142(04), 557-565. doi: doi:10.1017/S0031182014001577

- Gale, S.D., Erickson, L.D., Berrett, A., Brown, B.L., & Hedges, D.W. (2016). Infectious disease burden and cognitive function in young to middle-aged adults. *Brain, Behavior, and Immunity*, 52, 161-168. doi: 10.1016/j.bbi.2015.10.014
- Galván-Ramírez, M.d.l.L., Sánchez-Orozco, L.V., Rodríguez, L.R., Rodríguez, S., Roig-Melo, E., Troyo Sanromán, R., . . . Armendáriz-Borunda, J. (2013). Seroepidemiology of *Toxoplasma gondii* infection in drivers involved in road traffic accidents in the metropolitan area of Guadalajara, Jalisco, Mexico. *Parasites & Vectors*, 6(1), 1-9. doi: 10.1186/1756-3305-6-294
- Garbarino, E., Slonim, R., & Sydnor, J. (2011). Digit ratios (2D:4D) as predictors of risky decision making for both sexes. *Journal of Risk and Uncertainty*, 42(1), 1-26. doi: 10.1007/s11166-010-9109-6
- Gaskell, E. A., Smith, J. E., Pinney, J. W., Westhead, D. R., & McConkey, G. A. (2009). A Unique dual activity amino acid hydroxylase in *Toxoplasma gondii*. *PLoS ONE*, 4(3), e4801. doi: 10.1371/journal.pone.0004801
- George, J.M. (1992). The role of personality in organizational life: Issues and evidence. *Journal of Management*, 18(2), 185-213. doi: 10.1177/014920639201800201
- George, J.M., & Zhou, J. (2001). When openness to experience and conscientiousness are related to creative behavior: An interactional approach. *Journal of Applied Psychology*, 86(3), 513-524. doi: 10.1037/0021-9010.86.3.513
- Goldberg, L.R. (1990). An alternative "description of personality": The big-five factor structure. *Journal of Personality and Social Psychology*, 59(6), 1216-1229. doi: 10.1037/0022-3514.59.6.1216
- Guenther, W., Bielinski, M., Deptula, A., Zalas-Wiecek, P., Piskunowicz, M., Szwed, K., et al. (2012). Does *Toxoplasma gondii* infection affect cognitive function? A case control study. *Folia Parasitologica*, 59(2), 93-8.
- Hari Dass, S. A., & Vyas, A. (2014). *Toxoplasma gondii* infection reduces predator aversion in rats through epigenetic modulation in the host medial amygdala. *Molecular Ecology*, 23(24), 6114-6122. doi: 10.1111/mec.12888
- Haselhuhn, M. P., Wong, E. M., Ormiston, M. E., Inesi, M. E., & Galinsky, A. D. (2014). Negotiating face-to-face: Men's facial structure predicts negotiation performance. *The Leadership Quarterly*, 25(5), 835-845. doi: 10.1016/j.leaqua.2013.12.003
- Havlíček, J., Gašová, Z., Smith, A. P., Zvára, K., & Flegr, J. (2001). Decrease of psychomotor performance in subjects with latent 'asymptomatic' toxoplasmosis. *Parasitology*, 122(5), 515-520. doi: 10.1017/S0031182001007624
- Healy, D. (2015). Serotonin and depression. *British Medical Journal*, 350. doi: 10.1136/bmj.h1771

- Heckman, J. J. (2011). Integrating personality psychology into economics. *National Bureau of Economic Research Working Paper Series*, 17378. doi: 10.3386/w17378
- Hodgkinson, G.P., & Healey, M.P. (2011). Psychological foundations of dynamic capabilities: Reflexion and reflection in strategic management. *Strategic Management Journal*, 32(13), 1500-1516. doi: 10.1002/smj.964
- Hodková, H., Kolbeková, P., Skallová, A., Lindová, J., & Flegr, J. (2007). Higher perceived dominance in *Toxoplasma* infected men--a new evidence for role of increased level of testosterone in toxoplasmosis-associated changes in human behavior. *Neuroendocrinology Letters*, 28(2), 110-114.
- Hofstede, G., & McCrae, R. R. (2004). Personality and culture revisited: Linking traits and dimensions of culture. *Cross-Cultural Research*, 38(1), 52-88. doi: 10.1177/1069397103259443
- Houdek, P. (2016). What comes to a manager's mind: Theory of local thinking. *Journal of Management Inquiry*, 25(4), 359-366. doi: 10.1177/1056492616640380
- Jocham, G., Klein, T. A., & Ullsperger, M. (2011). Dopamine-mediated reinforcement learning signals in the striatum and ventromedial prefrontal cortex underlie value-based choices. *The Journal of Neuroscience*, 31(5), 1606-1613. doi: 10.1523/JNEUROSCI.3904-10.2011
- Jones, J. L., Kruszon-Moran, D., Wilson, M., McQuillan, G., Navin, T., & McAuley, J. B. (2001). *Toxoplasma gondii* infection in the united states: Seroprevalence and risk factors. *American Journal of Epidemiology*, 154(4), 357-365. doi: 10.1093/aje/154.4.357
- Judge, T.A., Bono, J.E., Ilies, R., & Gerhardt, M.W. (2002). Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology*, 87(4), 765-780. doi: 10.1037/0021-9010.87.4.765
- Judge, T.A., Colbert, A.E., & Ilies, R. (2004). Intelligence and leadership: A quantitative review and test of theoretical propositions. *Journal of Applied Psychology*, 89(3), 542-552.
- Judge, T.A., Heller, D., & Mount, M.K. (2002). Five-factor model of personality and job satisfaction: A meta-analysis. *Journal of Applied Psychology*, 87(3), 530-541. doi: 10.1037/0021-9010.87.3.530
- Judge, T.A., Higgins, C.A., Thoresen, C.J., & Barrick, M.R. (1999). The big five personality traits, general mental ability, and career success across the life span. *Personnel Psychology*, 52(3), 621-652. doi: 10.1111/j.1744-6570.1999.tb00174.x
- Khademvatan, S., Khajeddin, N., Saki, J., & Izadi-Mazidi, S. (2013). Effect of toxoplasmosis on personality profiles of iranian men and women. *South African Journal of Science*, 109, 1-4.

- Kocazeybek, B., Oner, Y. A., Turksoy, R., Babur, C., Cakan, H., Sahip, N., . . . Torun, M. M. (2009). Higher prevalence of toxoplasmosis in victims of traffic accidents suggest increased risk of traffic accident in *Toxoplasma*-infected inhabitants of Istanbul and its suburbs. *Forensic Science International*, 187(1–3), 103-108. doi: 10.1016/j.forsciint.2009.03.007
- Kramer, P., & Bressan, P. (2015). Humans as superorganisms: How microbes, viruses, imprinted genes, and other selfish entities shape our behavior. *Perspectives on Psychological Science*, 10(4), 464-481. doi: 10.1177/1745691615583131
- Kuncel, N.R., Hezlett, S.A., & Ones, D.S. (2004). Academic performance, career potential, creativity, and job performance: Can one construct predict them all? *Journal of Personality and Social Psychology*, 86(1), 148-161. doi: 10.1037/0022-3514.86.1.148
- Lafferty, K. D. (2006). Can the common brain parasite, *Toxoplasma gondii*, influence human culture? *Proceedings of the Royal Society B-Biological Sciences*, 273(1602), 2749-2755. doi: 10.1098/rspb.2006.3641
- Lamberton, P. H. L., Donnelly, C. A., & Webster, J. P. (2008). Specificity of the *Toxoplasma gondii*-altered behaviour to definitive versus non-definitive host predation risk. *Parasitology*, 135(10), 1143-1150. doi: doi:10.1017/S0031182008004666
- Lanchava, L., Carlson, K., Šebánková, B., Flegr, J., & Nave, G. (2015). No evidence of association between *Toxoplasma gondii* infection and financial risk taking in females. *PLoS ONE*, 10(9), e0136716. doi: 10.1371/journal.pone.0136716
- Lim, A., Kumar, V., Hari Dass, S. A., & Vyas, A. (2013). *Toxoplasma gondii* infection enhances testicular steroidogenesis in rats. *Molecular Ecology*, 22(1), 102-110. doi: 10.1111/mec.12042
- Lindebaum, D. (2013). Pathologizing the healthy but ineffective: Some ethical reflections on using neuroscience in leadership research. *Journal of Management Inquiry*, 22(3), 295-305. doi: 10.1177/1056492612462766
- Lindebaum, D., & Jordan, P. J. (2014). A critique on neuroscientific methodologies in organizational behavior and management studies. *Journal of Organizational Behavior*, 35(7), 898-908. doi: 10.1002/job.1940
- Lindová, J., Kubena, A. A., Štuncová, H., Křivohlavá, R., Novotná, M., Rubešová, A., . . . Flegr, J. (2010). Pattern of money allocation in experimental games supports the stress hypothesis of gender differences in *Toxoplasma gondii*-induced behavioural changes. *Folia Parasitologica*, 57(2), 136-142.
- Lindová, J., Novotná, M., Havlíček, J., Jozífková, E., Skallová, A., Kolbeková, P., . . . Flegr, J. (2006). Gender differences in behavioural changes induced by latent toxoplasmosis. *International Journal for Parasitology*, 36(14), 1485-1492. doi: 10.1016/j.ijpara.2006.07.008

- Lindová, J., Příplatová, L., & Flegr, J. (2012). Higher extraversion and lower conscientiousness in humans infected with *Toxoplasma*. *European Journal of Personality*, 26(3), 285-291. doi: 10.1002/per.838
- Ling, V. J., Lester, D., Mortensen, P. B., Langenberg, P. W., & Postolache, T. T. (2011). *Toxoplasma gondii* seropositivity and suicide rates in women. *The Journal of Nervous and Mental Disease*, 199(7), 440-444. doi: 10.1097/NMD.0b013e318221416e.
- Luthans, F., & Youssef, C. M. (2007). Emerging positive organizational behavior. *Journal of Management*, 33(3), 321-349. doi: 10.1177/0149206307300814
- Markovitz, A. A., Simanek, A. M., Yolken, R. H., Galea, S., Koenen, K. C., Chen, S., & Aiello, A. E. (2015). *Toxoplasma gondii* and anxiety disorders in a community-based sample. *Brain, Behavior, and Immunity*, 43, 192-197. doi: 10.1016/j.bbi.2014.08.001
- Maseland, R. (2013). Parasitical cultures? The cultural origins of institutions and development. *Journal of Economic Growth*, 18(2), 109-136. doi: 10.1007/s10887-013-9089-x
- Mayer, E. A., Knight, R., Mazmanian, S. K., Cryan, J. F., & Tillisch, K. (2014). Gut microbes and the brain: paradigm shift in neuroscience. *The Journal of Neuroscience*, 34(46), 15490-15496.
- McConkey, G. A., Martin, H. L., Bristow, G. C., & Webster, J. P. (2013). *Toxoplasma gondii* infection and behaviour – location, location, location? *The Journal of Experimental Biology*, 216(1), 113-119. doi: 10.1242/jeb.074153
- Mendy, A., Vieira, E.R., Albatineh, A.N., & Gasana, J. (2015a). *Toxoplasma gondii* seropositivity and cognitive functions in school-aged children. *Parasitology*, 142(9), 1221-1227. doi: doi:10.1017/S0031182015000505
- Mendy, A., Vieira, E.R., Albatineh, A.N., & Gasana, J. (2015b). Immediate rather than delayed memory impairment in older adults with latent toxoplasmosis. *Brain, Behavior, and Immunity*, 45, 36-40. doi: 10.1016/j.bbi.2014.12.006
- Mullainathan, S., & Shafir, E. (2013). *Scarcity: Why Having Too Little Means So Much*. London: Penguin Group.
- Novotná, M., Hanusova, J., Klose, J., Preiss, M., Havlicek, J., Roubalová, K., & Flegr, J. (2005). Probable neuroimmunological link between *Toxoplasma* and cytomegalovirus infections and personality changes in the human host. *BMC Infectious Diseases*, 5(1), 54. doi: 10.1186/1471-2334-5-54
- Novotná, M., Havlíček, J., Smith, A.P., Kolbeková, P., Skallová, A., Klose, J., . . . Flegr, J. (2008). *Toxoplasma* and reaction time: Role of *Toxoplasmosis* in the origin, preservation and geographical distribution of Rh blood group polymorphism. *Parasitology*, 135(11), 1253-1261. doi: doi:10.1017/S003118200800485X

- Pearce, B., Kruszon-Moran, D., & Jones, J. (2014). The association of *Toxoplasma gondii* infection with neurocognitive deficits in a population-based analysis. *Social Psychiatry and Psychiatric Epidemiology*, 49(6), 1001-1010. doi: 10.1007/s00127-014-0820-5
- Pedersen, M. G., Mortensen, P., Norgaard-Pedersen, B., & Postolache, T. T. (2012). *Toxoplasma gondii* infection and self-directed violence in mothers. *Archives of General Psychiatry*, 69(11), 1123-1130. doi: 10.1001/archgenpsychiatry.2012.668
- Pine, A., Shiner, T., Seymour, B., & Dolan, R. J. (2010). Dopamine, time, and impulsivity in humans. *The Journal of Neuroscience*, 30(26), 8888-8896. doi: 10.1523/JNEUROSCI.6028-09.2010
- Prandovszky, E., Gaskell, E., Martin, H., Dubey, J. P., Webster, J. P., & McConkey, G. A. (2011). The neurotropic parasite *Toxoplasma gondii* increases dopamine metabolism. *PLoS ONE*, 6(9), e23866. doi: 10.1371/journal.pone.0023866
- Příplatová, L., Šebánková, B., & Flegr, J. (2014). Contrasting effect of prepulse signals on performance of *Toxoplasma*-infected and *Toxoplasma*-free subjects in an acoustic reaction times test. *PLoS ONE*, 9(11), e112771. doi: 10.1371/journal.pone.0112771
- Raja, U., Johns, G., & Ntalianis, F. (2004). The impact of personality on psychological contracts. *Academy of Management Journal*, 47(3), 350-367. doi: 10.2307/20159586
- Reiber, C., Shattuck, E. C., Fiore, S., Alperin, P., Davis, V., & Moore, J. (2010). Change in human social behavior in response to a common vaccine. *Annals of Epidemiology*, 20(10), 729-733. doi: 10.1016/j.annepidem.2010.06.014
- Ronay, R., & Carney, D. R. (2013). Testosterone's negative relationship with empathic accuracy and perceived leadership ability. *Social Psychological and Personality Science*, 4(1), 92-99. doi: 10.1177/1948550612442395
- Rule, N. O., & Ambady, N. (2008). The face of success: Inferences from chief executive officers' appearance predict company profits. *Psychological Science*, 19(2), 109-111. doi: 10.1111/j.1467-9280.2008.02054.x
- Saeij, J. P. J., Boyle, J. P., & Boothroyd, J. C. (2005). Differences among the three major strains of *Toxoplasma gondii* and their specific interactions with the infected host. *Trends in Parasitology*, 21(10), 476-481. doi: 10.1016/j.pt.2005.08.001
- Schmidt, F.L., & Hunter, J. (2004). General mental ability in the world of work: Occupational attainment and job performance. *Journal of Personality and Social Psychology*, 86(1), 162-173. doi: 10.1037/0022-3514.86.1.162
- Shalley, C.E., Zhou, J., & Oldham, G.R. (2004). The effects of personal and contextual characteristics on creativity: Where should we go from here? *Journal of Management*, 30(6), 933-958. doi: 10.1016/j.jm.2004.06.007

- Sharot, T., Shiner, T., Brown, A. C., Fan, J., & Dolan, R. J. (2009). Dopamine enhances expectation of pleasure in humans. *Current Biology*, 19(24), 2077-2080. doi: 10.1016/j.cub.2009.10.025
- Shirbazou, S., Abasian, L., & Meymand, F.T. (2011). Effects of *Toxoplasma gondii* infection on plasma testosterone and cortisol level and stress index on patients referred to Sina Hospital, Tehran. *Jundishapur Journal of Microbiology*, 4(3), 167-173.
- Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-Positive Psychology: Undisclosed Flexibility in Data Collection and Analysis Allows Presenting Anything as Significant. *Psychological Science*, 22(11), 1359-1366. doi: 10.1177/0956797611417632
- Skallová, A., Kodym, P., Frynta, D., & Flegr, J. (2006). The role of dopamine in *Toxoplasma*-induced behavioural alterations in mice: an ethological and ethopharmacological study. *Parasitology*, 133(5), 525-535. doi: doi:10.1017/S0031182006000886
- Skallová, A., Novotná, M., Kolbeková, P., Gasova, Z., Vesely, V., Sechovska, M., & Flegr, J. (2005). Decreased level of novelty seeking in blood donors infected with *Toxoplasma*. *Neuroendocrinology Letters*, 26(5), 480-486.
- Spisak, B. R., Homan, A. C., Grabo, A., & Van Vugt, M. (2012). Facing the situation: Testing a biosocial contingency model of leadership in intergroup relations using masculine and feminine faces. *The Leadership Quarterly*, 23(2), 273-280. doi: 10.1016/j.leaqua.2011.08.006
- Stern, Y. (2009). Cognitive reserve. *Neuropsychologia*, 47(10), 2015-2028. doi: <http://dx.doi.org/10.1016/j.neuropsychologia.2009.03.004>
- Stock, A.-K., Heintschel von Heinegg, E., Köhling, H.-L., & Beste, C. (2014). Latent *Toxoplasma gondii* infection leads to improved action control. *Brain, Behavior, and Immunity*, 37(0), 103-108. doi: 10.1016/j.bbi.2013.11.004
- Sugden, K., Moffitt, T.E., Pinto, L., Poulton, R., Williams, B.S., & Caspi, A. (2016). Is *Toxoplasma gondii* infection related to brain and behavior impairments in humans? Evidence from a population-representative birth cohort. *PLoS ONE*, 11(2), e0148435. doi: 10.1371/journal.pone.0148435
- Tan, D., Soh, L. J. T., Lim, L. W., Daniel, T. C. W., Zhang, X., & Vyas, A. (2015). Infection of male rats with *Toxoplasma gondii* results in enhanced delay aversion and neural changes in the nucleus accumbens core. *Proceedings of the Royal Society B: Biological Sciences*, 282(1808). doi: 10.1098/rspb.2015.0042
- Tang, Y.-Y., & Posner, M. I. (2009). Attention training and attention state training. *Trends in Cognitive Sciences*, 13(5), 222-227. doi: 10.1016/j.tics.2009.01.009
- Teece, D.J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319-1350. doi: 10.1002/smj.640

- Tenter, A. M., Heckerroth, A. R., & Weiss, L. M. (2000). *Toxoplasma gondii*: from animals to humans. *International Journal for Parasitology*, 30(12–13), 1217-1258. doi: 10.1016/S0020-7519(00)00124-7
- Tillisch, K., Labus, J., Kilpatrick, L., Jiang, Z., Stains, J., Ebrat, B., . . . Mayer, E. A. (2013). Consumption of fermented milk product with probiotic modulates brain activity. *Gastroenterology*, 144(7), 1394-1401.e1394. doi: 10.1053/j.gastro.2013.02.043
- Torrey, E. F., Bartko, J. J., & Yolken, R. H. (2012). *Toxoplasma gondii* and other risk factors for schizophrenia: an update. *Schizophrenia Bulletin*, 38(3), 642-647. doi: 10.1093/schbul/sbs043
- Vranka, M. A., & Houdek, P. (2015). Many faces of bankers' identity: How (not) to study dishonesty. *Frontiers in Psychology*, 6(302). doi: 10.3389/fpsyg.2015.00302
- Wai, J., & Rindermann, H. (2015). The path and performance of a company leader: A historical examination of the education and cognitive ability of Fortune 500 CEOs. *Intelligence*, 53, 102-107. doi: 10.1016/j.intell.2015.10.001
- Webster, J. P. (2007). The effect of *Toxoplasma gondii* on animal behavior: Playing cat and mouse. *Schizophrenia Bulletin*, 33(3), 752-756. doi: 10.1093/schbul/sbl073
- Webster, J. P., & McConkey, G. A. (2010). *Toxoplasma gondii*-altered host behaviour: clues as to mechanism of action. *Folia Parasitologica*, 57(2), 95-104.
- Webster, J. P., Kaushik, M., Bristow, G. C., & McConkey, G. A. (2013). *Toxoplasma gondii* infection, from predation to schizophrenia: can animal behaviour help us understand human behaviour? *The Journal of Experimental Biology*, 216(1), 99-112. doi: 10.1242/jeb.074716
- Webster, J. P., Lamberton, P. H. L., Donnelly, C. A., & Torrey, E. F. (2006). Parasites as causative agents of human affective disorders? The impact of anti-psychotic, mood-stabilizer and anti-parasite medication on *Toxoplasma gondii*'s ability to alter host behaviour. *Proceedings of the Royal Society B*, 273(1589), 1023-1030. doi: 10.1098/rspb.2005.3413
- Wong, E. M., Ormiston, M. E., & Haselhuhn, M. P. (2011). A Face only an investor could love: CEOs' facial structure predicts their firms' financial performance. *Psychological Science*, 22(12), 1478-1483. doi: 10.1177/0956797611418838
- Yereli, K., Balcioğlu, I.C., & Özbilgin, A. (2006). Is *Toxoplasma gondii* a potential risk for traffic accidents in Turkey? *Forensic Science International*, 163(1–2), 34-37. doi: 10.1016/j.forsciint.2005.11.002
- Youssef, C. M., & Luthans, F. (2007). Positive organizational behavior in the workplace: The impact of hope, optimism, and resilience. *Journal of Management*, 33(5), 774-800. doi: 10.1177/0149206307305562

Zghair, K.H., AL-Qadhi, B.N., & Mahmood, S.H. (2015). The effect of toxoplasmosis on the level of some sex hormones in males blood donors in Baghdad. *Journal of Parasitic Diseases*, 39(3), 393-400. doi: 10.1007/s12639-013-0382-6

Table 1. – Studies on *Toxoplasma*'s influence on human cognitive functions

Study	Country	Type of study [specific group]	N (<i>Toxoplasma</i> - positive/control)	Methods	Findings
Ferreira et al. (2013)	Brazil	Survey of hospital patients [children, 6–13 years old]	8/92	Scholastic Performance Test	Infected subjects had lower results of the mathematics subtest of the Scholastic Performance Test.
Flegr, Novotná, & Lindová (2008)	Czech Republic	Behavioral study	58/278	Reaction time test (psychomotor performance)	Infected subjects (but only women) had lower psychomotor performance.
Flegr, Havlíček, Kodym, Malý, &	Czech Republic	Survey of subjects	146/446	Correlation between	Infected subjects

Smahel (2002)		involved in traffic accidents (case-control)		relative risk of traffic accidents and <i>Toxoplasma</i> infection	had increased risk of traffic accidents.
Flegr, Klose, Novotná, Berenreitterová, & Havlíček (2009)	Czech Republic	Prospective cohort study design [male draftees]	From 3,890 subjects were 29.7% toxo-positive	Correlation between relative risk of traffic accidents and <i>Toxoplasma</i> infection	Infected subjects (but only RhD negative) had increased risk of traffic accidents.
Havlíček, Gašová, Smith, Zvára, & Flegr (2001)	Czech Republic	Double blind behavioral study	60/56	Reaction time test (psychomotor performance)	Decrease of psychomotor performance of infected subjects.
Lanchava, Carlson, Šebánková, Flegr, & Nave (2015)	Czech Republic	Behavioral study [women]	39/40	Financial decision-making experiment	Infection was not associated with financial decision-making in females.

Novotná et al. (2008)	Czech Republic	Behavioral study	1st study 41/73, 2nd study 151/288, 3rd study 95/220	Reaction time test (psychomotor performance)	Decrease of psychomotor performance of infected subjects (but only RhD negative).
Příplatová, Šebánková, & Flegr (2014)	Czech Republic	Double blind behavioral study	44/192	A test of acoustic prepulse inhibition of simple reaction times	Infected subjects had prolonged reaction times to acoustic signals.
Beste, Getzmann, Gajewski, Golka, & Falkenstein (2014)	Germany	Behavioral study [seniors, 63+]	36/36	Auditory distraction paradigm	Compromisation of attentional allocation, and disengagement of infected subjects.
Gajewski, Falkenstein, Hengstler, &	Germany	Double blind	42/42	Battery of	Infected subjects

Golka (2014)		behavioral study [seniors, 65+]		neuropsychological tests	had an impairment of different aspects of memory.
Stock, Heintschel von Heinegg, Köhling, & Beste (2014)	Germany	Double blind behavioral study	18/18	Stop-change paradigm	Infection was not associated with cognitive control processes (infected subjects were better at these tasks).
Alvarado-Esquivel et al. (2014)	Mexico	Cross sectional survey (a convenience sampling)	71/143	Correlation between clinical characteristics and <i>Toxoplasma</i> infection	Infection was associated with memory impairment.
Alvarado-Esquivel, Torres- Castorena, Liesenfeld, Estrada-	Mexico	Survey of subjects involved in work	From 133 subjects involved in	Correlation between relative risk of work	Infected subjects (but only with low

Martínez, & Urbina-Álvarez (2012)		accidents (case-control)	accident were 12 toxo-positive; from 266 control were 20 toxo-positive	accidents and <i>Toxoplasma</i> infection	socioeconomic status) had an increased risk of work accidents.
Galván-Ramírez et al. (2013)	Mexico	Survey of subjects involved in traffic accidents (case-control)	From 159 subjects involved in accident were 54 toxo-positive; from 164 control were 59 toxo-positive	Correlation between relative risk of traffic accidents and <i>Toxoplasma</i> infection	Infected subjects had an increased risk of traffic accidents.
Sugden et al. (2016)*	New Zealand	A population-representative birth-cohort study	236/837	Correlation between various phenotypes and <i>Toxoplasma</i> infection	Infection was not associated with poor impulse control or

					neurocognitive impairment.
Guenther et al. (2012)	Poland	Behavioral study	26/44	Battery of neuropsychological tests	Infection was not associated with any cognitive impairments.
Kocazeybek et al. (2009)	Turkey	Survey of subjects involved in traffic accidents (case-control)	From 243 subjects involved in accident were 130 toxo-positive; from 200 control were 56 toxo-positive	Correlation between relative risk of traffic accidents and <i>Toxoplasma</i> infection	Infected subjects had increased risk of traffic accidents.
Yereli, Balcioglu, & Özbilgin (2006)	Turkey	Survey of subjects involved in traffic accidents (case-	From 185 subjects involved in accident were 61	Correlation between relative risk of traffic accidents and	Infected subjects had an increased risk of traffic

		control)	toxoplasma-positive; from 185 control were 16 toxoplasma-positive	<i>Toxoplasma</i> infection	accidents.
Gale, Brown, Erickson, Berrett, & Hedges (2015)	USA	A population-representative study	From 4,178 subjects were 19.1% toxoplasma-positive	Battery of neuropsychological tests	Infected subjects (but only with low socioeconomic status and in certain racial-ethnic groups) had various impairment of cognitive functions.
Mendy, Vieira, Albatineh, & Gasana (2015a)	USA	A population-representative	From 1,755 subjects were	Battery of neuropsychological	Infection was associated with

		study [school-aged children 12–16 years old]	7.7% toxo-positive	tests	lower reading skills and memory capacities.
Mendy, Vieira, Albatineh, & Gasana (2015b)	USA	A population-representative study [seniors, 60+]	From 4,485 subjects were 41% toxo-positive	Memory tests	Infection was associated with lower immediate memory.
Pearce, Kruszon-Moran, & Jones (2014)	USA	A population-representative study	944/3,439	Battery of neuropsychological tests	Infected subjects (but only with low socioeconomic status) had various impairment of cognitive functions.

Note: The above-mentioned studies were selected through the Google Scholar and PubMed databases. Laboratory and field studies, case studies and surveys estimating the influence of toxoplasmosis on the cognition of otherwise healthy people were included. The studies were searched for

using the following key words: human, *Toxoplasma*, toxoplasmosis, cognition, cognitive, memory, attention, perception, reaction, and problem solving. Articles from 1950 to the present (May, 2016) were included. The results were comprised of more than 14,000 references. After excluding unsuitable articles (reviews, conceptual papers, animal studies, in vivo studies, studies on psychiatric, neurological, and other diseases, cross-country comparative studies, and unpublished studies, typically theses), 41 remained. Further 19 studies were excluded because they didn't relate directly to cognitive abilities; they monitored the prevalence of toxoplasmosis in different professions and other groups, or they were duplicities referred to in Table 2. The number of toxo-positive participants is an estimate across different serological analyses (i.e. acute and latent infections). * The study is presented in both systematic reviews.

Table 2. – Studies on *Toxoplasma*'s influence on human personality traits

Study	Country	Type of study	N (<i>Toxoplasma</i> -positive/control)	Methods	Findings
Flegr (2010)	Czech Republic	Convenience samples	113/330; 68/242; 55/136; 276/47	Unique questionnaire (Toxo94)	Infected subjects expressed various personality aberrations (see citations in the main text).
Flegr & Hrdý (1994)	Czech Republic	Convenience sample	90/248	Cattell's 16 Personality Factor Questionnaire	<i>Toxoplasma</i> -positive men had lower superego strength and protension.
Flegr et al. (1996)	Czech Republic	Convenience sample	73/321	Cattell's 16 Personality Factor Questionnaire	Infection in men was positively correlated with low superego strength, protension, guilt proneness, and group

					dependency. For women, the prevailing traits were affectothymia, alaxia, untroubled adequacy and self-sufficiency.
Flegr et al. (2003)	Czech Republic	Survey of military personnel	229/628	Cloninger's Temperament and Character Inventory	Toxoplasma-positive subjects had lower novelty seeking, impulsiveness, extravagance, and disorderliness scores. Infected subjects also had lower IQ.
Flegr & Havlíček (1999)	Czech Republic	Convenience sample of women	55/136	Cattell's 16 Personality Factor Questionnaire	Infected women had higher intelligence, lower guilt proneness, and possibly also higher ergic tension.
Flegr, Kodym, & Tolarová	Czech	Convenience sample of	230/0	Cattell's 16	Affectothymia, surge, high

(2000)	Republic	women		Personality Factor Questionnaire	superego strength, parmia, and protension correlated with the length of the infection.
Flegr, Preiss, & Klose (2013)	Czech Republic	Survey of military personnel	154/337	N-70 and NEO- PI-R Questionnaire; Wiener Matrizen-Test and Wiener Matrizen-Test of intelligence	Infected subjects expressed lower levels of potentially pathognomic factors measured with the N-70 questionnaire, and neuroticism. <i>Toxoplasma</i> - infected subjects expressed lower intelligence score (while RhD-negative).
Lindová et al. (2006)	Czech Republic	Double-blind testing (convenience sample)	49/214	Cattell's 16 Personality Factor Questionnaire	Infected men scored significantly lower in conscientiousness and self- control than uninfected men

					and a trend in the opposite direction was observed in women. Infected men scored lower in warmth than uninfected men, whereas there was no difference in women.
Lindová et al. (2010)	Czech Republic	Convenience sample	56/295	Experimental economic games	Infected men were less cooperative, whereas infected women were more cooperative compared to their non-infected counterparts.
Lindová, Příplatová, & Flegr (2012)	Czech Republic	Convenience sample	47/76	NEO-PI-R Questionnaire	<i>Toxoplasma</i> -infected male and female subjects had higher extraversion and lower conscientiousness.
Novotná et al. (2005)	Czech	Survey of military personnel	From 533	Temperament	<i>Toxoplasma</i> -positive subjects

	Republic		subjects were 50.5% toxo- positive	and Character Inventory; Eysenck's Lie scale	had lower novelty seeking score.
Skallová et al. (2005)	Czech Republic	Survey of blood donors	From 290 subjects were 61.2% toxo- positive	Temperament and Character Inventory; Eysenck's Lie scale	<i>Toxoplasma</i> -positive subjects had lower novelty seeking score.
Cook et al. (2015)	Germany	Survey of healthy controls as a part of a case-control study	475/474	Questionnaire for Measuring Factors of Aggression, Disinhibition subscale of the Sensation	Infection was associated with higher reactive aggression scores among women, but not among men. Infection was also associated with higher impulsive sensation-seeking among younger men.

				Seeking Scale	
Khademvatan et al. (2013)	Iran	Convenience sample	112/125	Cattell's 16 Personality Factor Questionnaire	Infected women had higher apprehension, privateness, tension scores, and lower openness to change scores. Infected men had higher vigilance and mistrust scores.
Sugden et al. (2016)*	New Zealand	A population-representative birth-cohort study	236/837	Correlation between various tests and questionnaires and <i>Toxoplasma</i> infection	Infection was not associated with any personality aberrations.

Note: The above-mentioned studies were selected through the Google Scholar and PubMed databases. Laboratory and field studies, case studies and surveys estimating the influence of toxoplasmosis on the personality traits of otherwise healthy people were included (studies estimating influence on psychiatric and mental diseases and personality disorders were not targeted, as they're outside the scope of this paper). The studies were searched for using the following key words: human, *Toxoplasma*, toxoplasmosis, personality, and traits. Articles from 1950 to the present (May 2016) were included. The results were comprised of more than 12,000 references. After excluding unsuitable articles (reviews, conceptual papers, animal studies, in vivo studies, studies on psychiatric, neurological, and other diseases, cross-country comparative studies, and unpublished studies, typically theses), 42 remained. Further 27 were excluded because they didn't relate directly to personality traits; they monitored the prevalence of toxoplasmosis in different professions and other groups, or they were duplicities referred to in Table 1. The number of toxo-positive participants is an estimate across different serological analyses (i.e. acute and latent infections). * The study is presented in both systematic reviews.

7. Příloha č. 1 – Do People in Post-Communist Countries Cheat So Much? Laboratory Study Using a Student Sample

Julie Novakova, Petr Houdek, Jan Jolič, Jaroslav Flegr

Abstract

In our study, we focused on the prevalence of cheating in a subject sample from a post-communist country, the Czech Republic, and individual characteristics, which influence dishonest behavior. We used a die rolling task where participants can cheat on their reward to determine whether anonymity conditions increase the frequency of cheating. Our results show that participants playing alone did not cheat significantly more than the control group throwing dice publicly. Although cheating in both groups occurred systematically, the rates of cheating were low, especially in comparison with previous studies conducted in post-communist countries. We did not find that gender, cognitive abilities (measured by the Cognitive Reflection Task and Meili Memory Test), risk and social preferences (measured by a battery of experimental games) robustly predicted the rate of cheating in our sample.

Keywords

cheating, dishonesty, laboratory experiment, cognitive reflection, gender, social preferences

7.1 Introduction

Even a quarter of a century after the iron curtain's fall, its effects are manifest in the post-Soviet block. People in post-communist countries have been found to be less trusting (Bjørnskov 2007, Hjøllund et al. 2001), prone to cheating (Ariely et al. 2014, Hrabak et al. 2004) and corruption (Hrabak et al. 2004).

A number of studies showed that cultural behavioral patterns tend to be transmitted through several generations even after the external conditions had changed, for example by moving to another, often culturally very different, country or by a political shift in one's own country (Furtado et al. 2013, Algan & Cahuc 2010, Giuliano 2007). Hjøllund et al. (2001) have shown that the effects of dictatorship can be long-lasting and that the transition from communism to democracies' levels of social capital can take several decades.

Ariely et al. (2014) tested rates of cheating in a dice rolling task for people with East German or West German family background. They found increased levels of cheating in subjects of East German background. Similarly, Barr & Serra (2010) demonstrated that students from countries with high corruption levels (such as the post-communist block) studying in the UK were significantly more willing to bribe in an experimental corruption game, although this tendency had been mitigated by the time spent in the UK. Fisman & Miguel (2007) studied parking violation among world diplomats based in NYC and found that violating the rules and not paying off the parking tickets correlated strongly with the diplomat's home country corruption measures. The "antisocial" behavior shifted when the city implemented measures sanctioning unpaid parking tickets by removing the diplomatic license. Henrich et al. (2001) showed in their renowned cross-cultural work that acceptance of selfish behavior differs vastly between countries. However, some studies, such as Pascual-Ezama et al. (2015) do not

show any difference in cheating in experimental games for participants from different countries.

Cheating appears not to be the only antisocial behavioral pattern associated with post-communist states. Antisocial punishment has also been shown to differ significantly across societies, with much higher abundance in less stable, high-corruption, low civic cooperation norms-possessing countries (Herrmann et al. 2008). Punishment as a moderator of cooperation is especially non-effective in low-trust, often post-communist states such as Russia, Ukraine or Belarus (Balliet & Van Lange 2013).

The Czech Republic has peacefully transitioned to democracy in November 1989 (by the so called “Velvet Revolution”) – roughly a year before East Germany. We wanted to explore whether the rates of cheating are comparable to those of East Germans and also tested whether young people who did not experience the communist regime or experienced it only as pre-school children still exhibit the low-trust, dishonest tendencies typical for communist and post-communist countries – as the family background characterization (not necessarily upbringing in East Germany) in Ariely et al. (2014) and several cultural transmission studies (Furtado et al. 2013, Algan & Cahuc 2010, Giuliano 2007) would suggest. A model by Hauk & Saez-Marti (2002) shows the mechanics of cultural transmission of corruption, which suggests close dependence of corruption on education in family and expectations about ethics and policies in society (which depends greatly on the political climate in a country). Antisocial punishment has been previously detected in Czech population (Kuběna et al. 2014).

Moreover, we tested whether increased sense of privacy and anonymity (enabled by having the participants in the experimental group throw dice alone, separated from others and the experimenters by cardboard partitions, as opposed to sitting by open tables in the control

group) facilitates cheating. Anonymity had been previously shown to increase selfishness (for a review see Camerer 2003, p. 62-63).

We also planned to investigate possible mediators of dishonesty such as one's gender (Muehlheusser et al. 2015, Barfort et al. 2015, Friesen & Gangadharan 2014), prosocial tendencies, cognitive and memory abilities (Ponti & Rodriguez-Lara 2015), future discounting, willingness to risk (Rigby et al. 2015), and personality characteristics (McTernan et al. 2014) measured by the Big Five system. This part of the work was conceived as an observational study for this investigation and also with respect to a separate study aimed at the conditions influencing cooperative behavior.

Despite the possible criticism of an “artificial” experimental approach, such studies are relevant for real-world dishonesty assessment, as experimentally tested mediators of cheating had been shown earlier to have a practical impact on dishonest behavior (Hanna & Wang 2013, Ruffle & Tobol 2015). Falk and Heckman (2009) discussed the contribution of laboratory experiments in social sciences and stress the importance of controlled variation in lab, known degrees of conditions, the ability to answer very specific questions, allow replicability and provide insights relevant also outside the lab. That of course extends to dice rolling experiments too, which had been used for answering a whole spectrum of questions ranging from tendencies of cheaters to enter public service (Hanna & Wang 2013) to comparisons of entrance scores of soldiers and their propensity to cheat (Ruffle & Tobol 2015). However, like in all experiments, it's important to have a well-defined methodology, for experimental work is very sensitive to setting up the initial conditions for answering the right questions. In some experiments, it's hard to say whether the control group really is a good control and not just a different experimental group (see Cohn et al. 2014, and Vranka & Houdek 2015).

Dishonesty-related laboratory experiments bear a great importance for policy. The cultural transmission of corruption combined with a self-selection of dishonest individuals into public service in high-corruption countries paints a rather gloomy picture of future prospects of developing and post-communist countries. Nevertheless, the studies also show that policies matter, and moreover, in low-corruption countries, dishonest people tend *not* to go into the state sector (Barfort et al. 2015).

7.2 Sample and Methods

7.2.1 Sample

The study was conducted using a sample of 148 Czech students of a large Czech university located in the North Bohemia province. It is among the economically poorest regions of the Czech Republic with high unemployment rates.

The participants were invited to join the study through the university's social networks and leaflets on the notice-boards. 81 (54.7%) were female, 67 (45.3%) male. Their age ranged from 19 to 28 (mean 22, median 22). All participants behaved accordingly to the experimental protocol and therefore none was excluded from the sample.

7.2.2 Course of the experiment

The experiment has been conducted in five sessions over two runs, in May and November 2014, respectively. The subjects were randomly assigned into sessions and groups and given individual numbers through which they would log into the experimental interface. Each time, there were 17 to 20 participants in one room, along with experimenters prepared to answer questions regarding the course of the experiment and to solve the potential problems, should any arise. In the experimental group in the room with large partitions between the computer stations, two experimenters sat in the front, unable to see the participants unless they had

raised their hand. In the control group, the subjects sat by computer stations in an open space, watched by four experimenters for the whole time.

After having sat at the available computer stations and read the experimental instructions (listed in the Supplementary Material in an English translation from the Czech original), the subjects were asked if they understood everything before commencing the experiment. They first played five experimental games for the assessment of their social preferences, and then participated in a die rolling experiment in which they had the opportunity to cheat, a questionnaire focused on their health and personal characteristics, especially related to altruistic, cooperative and fair-perceived behavior, a hypothetical task of future discounting, and a risk-taking experiment for their rewards. All of the experimental instructions can be found in the Supplementary Material. Due to the size of the sample, the sequence of the tasks had not been randomized, but previous studies such as Blanco et al. (2011) suggest that it does not play a marked role in the subjects' decisions.

At the end of the experiment, the subjects received their earnings from the experimental games, die rolling and risk-taking parts of the experiment. The sum was distributed in total, it was therefore impossible to tell how much they had earned in which respective part of the study.

They were also asked to fill in a post-experimental questionnaire (asking whether they had any ideas or complaints for the experimenters consider, what they thought had been the purpose of the experimental tasks, and finally, if and how much the other participants had cheated according to them, as Innes & Mitra (2009) had shown that expectations about others' behavior can influence one's own decisions).

7.2.3 Methods

Dice rolling has been used to measure the propensity to cheat e.g. in Fischbacher & Föllmi-Heusi (2013), Hanna & Wang (2013), Ariely et al. (2014) or Ruffle & Tobol (2015). In our experiments, the subjects were asked to roll a fair hexagonal die forty times and record each number of points. The subjects could cheat by writing down a different (higher) number than they had actually rolled in each of the 40 die rolls (with expected mean of $3.5 = (1+2+3+4+5+6)/6$). Their reward depended on the overall outcome of the die rolling. For each point, participants got 5 tokens, representing 0.5 CZK, i.e. they could earn roughly $3.5 \times 40 \times 0.5 = 70$ CZK \approx 3 USD in this task.

In the control group, they could potentially see each other's numbers as the computers by which they sat were stationed by octagonal tables. Moreover, four experimenters were thoroughly observing the room.

Participants in the experimental group sat by computer stations divided by partitions high and wide enough to give the subjects complete privacy. The two present experimenters could not see anyone's work stations and were only present to greet the subjects, explain the instructions and remain there in case of any questions or technical problems.

Photos of mock control group and mock experimental group sessions are included at the end of the Supplementary Material (Part 2, Photo 1 and 2).

All subjects recorded the points scored in each roll in a computer interface, through which they also played the games and answered the questionnaire. Each had received a randomly allocated number through which they could log in into the interface.

A battery of tests consisting of experimental games (Dictator Game (Forsythe et al. 1994), Ultimatum Game (Güth et al. 1982), Trust Game (Berg et al. 1995), Three-Player Ultimatum

Game (analogous to Knez & Camerer 1995, Güth & van Damme 1998, and Kagel & Wolfe 2001) and Reversed Dictator Game (analogous to the “taking games” in Cox et al. 2002, Bardsley 2005, and List 2007)) was used to assess the subjects' social preferences. The games' instructions can be seen in the Supplementary Material. Each of the games was played with 400 tokens at stake, representing 40 CZK. The subjects were paired fully anonymously and each time randomly with a different player.

Meili's picture memory test was used for testing the subjects' short-term memory. The classic Cognitive Reflection Test with one added question (“In the finish of a race, you outrun the second runner. In which place do you finish?”) was used for assessing the subjects' cognitive abilities, as these were shown to be closely linked to honesty in a task similar to ours (Ruffle & Tobol 2015), although another similar study by Hanna and Wang (2013) did not find any connection of abilities and (dis)honest behavior.

The questionnaire included hypothetical temporal discounting tasks, mini-Big Five psychological questionnaire (characteristics from wherein, namely agreeableness and neuroticism, were found to be negatively connected by cheating by Hanna & Wang (2013)), and questions regarding one's prosocial/antisocial behavioral patterns and socioeconomic status. In the risk-taking experiment, the subjects were asked to either earn nothing above their reward so far, or earn additional 40 CZK with a 50% probability or lose an amount climbing from 4 to 80 CZK with an equal probability. A willingness to take risks can be connected to dishonesty, as Rigby et al. (2015) had shown.

The statistical analysis was conducted using the open-source R software (www.r-project.org) and IBM SPSS Statistics 20 (for the mixed linear model).

7.3 Results

7.3.1 Rates of cheating

A one-sided Wilcoxon test showed no difference in mean points scored by the experimental and control group ($W=2856.5$, $p=0.273$). The Cohen's D effect size was small, with a value of 0.14. The control group rolled on average 3.62 points in each roll, while the experimental group rolled 3.66 on average.

When compared to a same-size randomly generated sample of the same number of rolls with equal probabilities of each number of points, the frequencies of rolls of different sides of a die differed significantly ($\chi^2=18.41$, $df=10$, $p=0.048$), suggesting the presence of some cheating. However, they did not differ significantly between the experimental and control group ($\chi^2=3.96$, $df=5$, $p=0.556$).

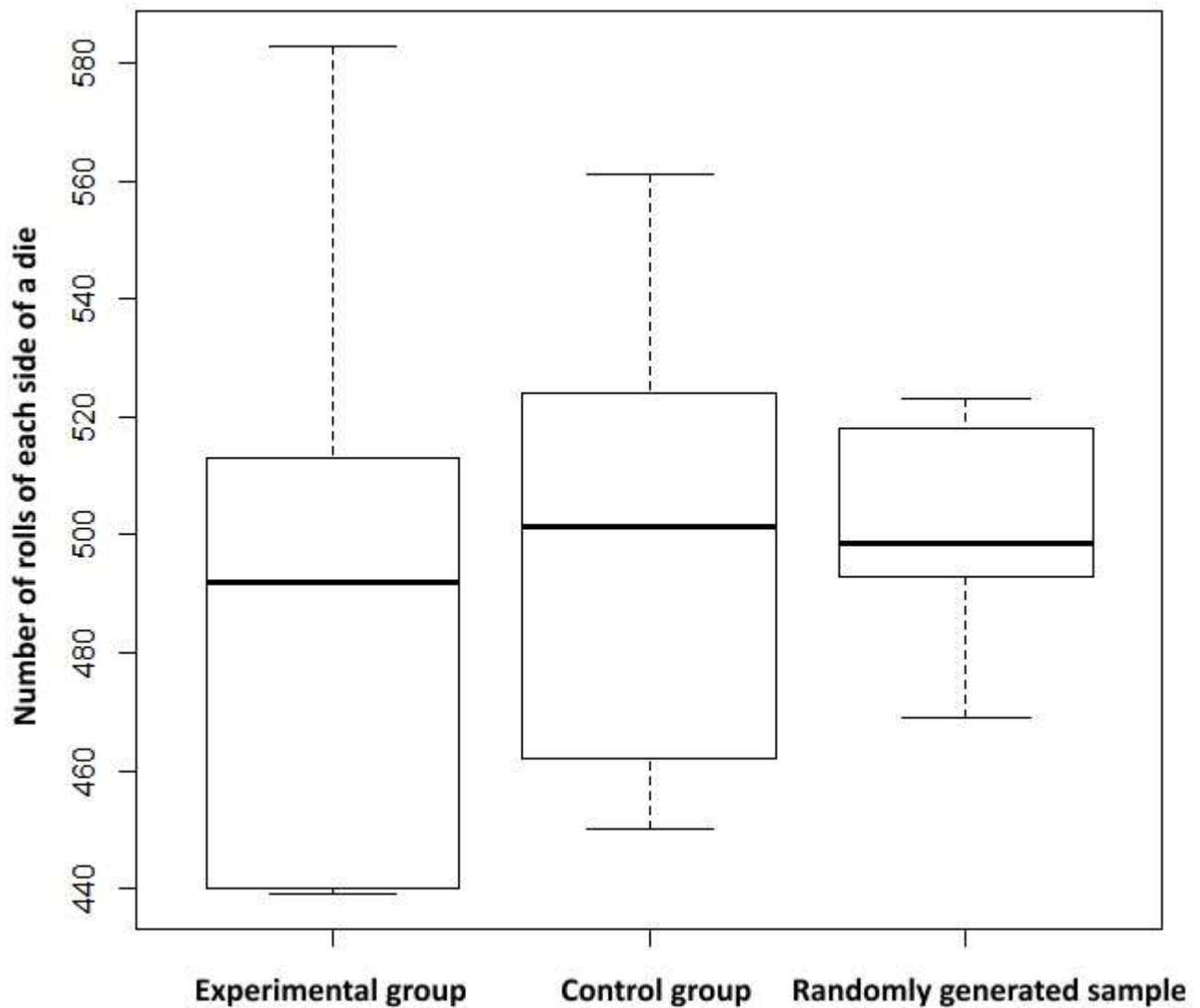


Fig. 1: The variances in the number of rolls of each side of a die between the control group, experimental group and a randomly generated sample of the same size. In the randomly generated sample, each side was rolled approximately the same number of times, whereas in both groups of subjects the number of rolls of a different number of points differed more.

The frequencies of rolls of each side of the die differed significantly (Kruskal-Wallis chi-sq.=50.82, df=5, $p<0.0001$). Figure 1 below illustrates the frequencies of rolling the respective sides of a die.

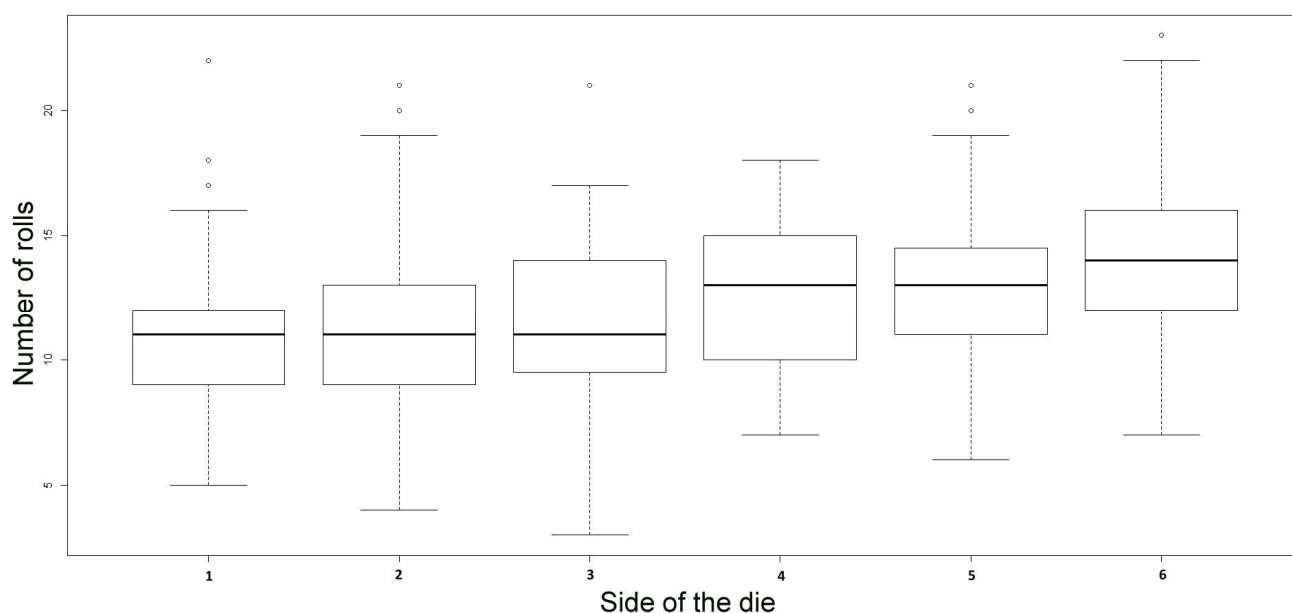


Fig. 2: The number of rolls (in a given round and group) for each side of the die.

The possibility of an autocorrelation between rounds and trends during the course of the experiment, signifying a possible gradual development of cheating behavior, was tested by dividing the set in quarters and testing if they differ in the points scored by the subjects. An ANOVA model showed no significant difference in points scored between the phases of the experiment ($df=3$, $\text{sum sq.}=114$, $\text{mean sq.}=37.9$, $F=0.06$, $p=0.981$). When the round of the experiment was filtered out, the effect of the points on each side of the die on the reported frequencies of their rolls remained very strong ($p<0.0001$), indicating that the rate of cheating did not evolve in time.

7.3.2 Factors influencing cheating

We had let the subjects play several experimental games, complete an extended Cognitive Reflection Test and fill in a short questionnaire including questions about their family income level, mini-Big Five psychological questionnaire, and hypothetical financial decisions for assessing their temporal discounting and real reward gamble for assessing their risk preferences.

In a mixed linear model, subjects' group, gender, cognitive reflection, temporal discounting, family income, Big Five personality traits (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism), risk-taking results, and behavior in the experimental games did not have any significant effect on the points scored by a subject.

Type III Tests of Fixed Effects ^a				
Source	Numerator df	Denominator df	F	Sig.
Intercept	1	5193.609	494.228	.000
Cognitive reflection test results	4	5193.609	.931	.445
Experimental/control group	1	5193.609	.082	.775
Gender	1	5193.609	2.131	.144
Family Income Level	4	5193.609	1.661	.156
Given in Dictator Game	1	5193.609	.000	.993
Taken in Reversed DG	1	5193.609	1.435	.231
Sent in Ultimatum Game	1	5193.609	3.052	.081
Sent in 3-player UG	1	5193.609	1.444	.230
Sent in Trust Game	1	5193.609	.261	.610
Returned in Trust Game	1	5193.609	.278	.598
Big Five 1	1	5193.609	.463	.496
Big Five 2	1	5193.609	.545	.460
Big Five 3	1	5193.609	.113	.737
Big Five 4	1	5193.609	.671	.413
Big Five 5	1	5193.609	.185	.667
Meili memory test score	1	5193.609	.633	.426
Risk-taking results	1	5193.609	.467	.494
Temporal discounting	1	5193.609	.062	.804

a. Dependent Variable: Points rolled.

Table 1: Mixed linear model including the subjects' group, gender, cognitive reflection, temporal discounting, family income, Big Five personality traits, risk-taking, and behavior in the experimental games. No significant effects of the tested variables were shown by the data.

7.3.3 External validity test

We tested the external validity of die rolling results as an indicator of dishonesty across several dishonesty-related questions in the questionnaire: 1. If a shopkeeper gave you back more money than supposed to, would you remind him/her? 2. Do you ever purchase bus or train tickets for a shorter distance than you really travel? 3. A friend had lent you money but

forgot about it. Do you remind him/her? 4. Do you use cheat sheets or copy answers during school exams? 5. If you found a wallet with approximately 2 000 CZK inside, would you hand it in to the police, or take the money and toss away the wallet? 6. You see a thief in a shop. Do you report him/her? 7. Do you lie in questionnaires like this one?

Several of the questions were yes-no, several multiple response. To obtain a measure of a participant's overall tendency to cheat, we standardized them to binary variables where 0 always meant dishonest behavior and 1 honest. The values were then added into one aggregate variable signifying the overall obtained measure of dishonesty. The higher value (possible range from 0 to 7), the higher honest behavior, and vice versa. The average “honesty value” was 4.82, the median value was 5.

A one-sided Spearman correlation with the value of rolled points found no significant correlation between those two possible measures of dishonest behavior ($p=0.343$, $\rho=-0.034$).

7.3.4 Post-experimental questionnaire assessment

In the post-experimental questionnaire, the participants have been asked the following questions regarding the die rolling task: What do you think was the purpose of the die rolling experiment? Do you think that the other participants cheated in the die rolling experiment? If you think that they did, how many points “extra” would you think they added (answers available in deciles)?

We found that 50.3% of participants thought that others had cheated, while 49.7% did not think so. A one-sided Wilcoxon test of the amount won in the die rolling (assuming those who considered others cheating would themselves cheat more, as previous studies had shown) showed a marginal effect ($t=1.373$, $df=141.789$, $p=0.086$) of a small size (Cohen's $D=0.23$).

The who reported “yes” had rolled 146.96 points on average, whereas those answering “no” had rolled 144.24 points.

Only a half of the subjects answered the additional question (logically, as it was intended only for those who answered “yes” in the previous one). On average, they expected others to add 21-30% points to their values. The Kruskal-Wallis rank sum test showed no significant differences between the number of points rolled by each of the selected deciles (chi-sq.=7.454, df=9, p=0.59).

7.4 Discussion

Even though the subjects had ample opportunity to cheat, we found cheating to be decidedly low in overall and there was no significant difference between the control and experimental group. The results were surprising for students had been previously found to exhibit readiness to cheat (Rigby et al. 2015), as had post-communist countries' populations (Ariely et al. 2014, Hrabak et al. 2004).

Especially contrary to a methodologically similar approach in Ariely et al. (2014), we have found very low levels of cheating in a die rolling task in a population of post-communist country citizens. The difference in the number of rolls of each side of the die and the significant difference between the actual data and a randomly generated non-biased sample suggests that the subjects had in fact cheated and reported higher numbers of points more often. Nevertheless, the overall rates of cheating had been low and did not differ significantly between the experimental and control group. In Ariely et al.'s (2014) experiment, East Germans rolled 3.83 points on average and West Germans 3.68 points, whereas in our study, the experimental group rolled 3.66 and the control group 3.62 points – both out groups therefore seemed to cheat even less than the West Germans in Ariely et al. (2014).

None of the tested predictors of cheating had a significant effect on the number of scored points. However, as the levels of cheating remained very low and the sample was not very large, this is not surprising. Most subjects seemed to cheat very little if at all. The middle half of the subjects scored between 137.5 and 152.5 points. Compared to the expected score of 140, it suggests existent but low levels of cheating across the sample. For the experimental group, the 25% quantile was at 138 and the 75% quantile at 153; for the control group, these were 137 and 150.5, respectively. Consistently with the findings of Innes & Mitra (2009), those who had expected others to behave dishonestly also showed a higher proportion of cheating, although the effect was only marginal (non-significant). The external validity test does not show any correlation with the die rolling results, but it is impossible to make a conclusion upon it with certainty using our sample with very low levels of cheating.

We consider it fruitful to study more populations of post-communist countries in near future, as it could shed more light on the differences between the regime's impact on people's values and ethical behavior in the respective countries. Germany, studied by Ariely et al. (2014), had been divided after WWII, strongly traumatized by the war past and division, symbolized most blatantly by the Berlin Wall. However, that remains just a pure speculation, and the Czech Republic has its own historic traumas including the Soviet intervention in 1968 and the subsequent “normalization” era in the 1970s (Sobell 1987). Nevertheless, studying the post-communist block's populations by this simple die rolling task could be helpful in painting a more tangible picture of (dis)honesty and (mis)trust in countries which had suffered under the communist regime and often possess problems related to criminality, corruption, weak institutions and low generalized trust nowadays. These issues are closely interlinked (Bjørnskov 2007). Studying a greater number of countries would help us assess the extent of the effects of communist past and the effects of the ways of transition to democracy and capitalism.

The potential limitations of this study include using a student sample, which may not reflect the full variability of behavior in the population (Henrich et al. 2010), and furthermore consists of younger people with little or no direct experience with the previous communist regime. On the other hand, we specifically wanted to explore whether the effects of living in a post-communist country would affect young people's levels of cheating, and found it to have no notable impact. Potentially, the participants could also perceive experimenter's demand not to cheat despite the lure (as summarized by Zizzo 2009). That, however, does not explain the difference from samples in other similar studies where cheating had been more prevalent (Ruffle & Tobol 2015, Ariely et al. 2014, Hanna & Wang 2013, Fischbacher & Föllmi-Heusi 2013). Moreover, the post-experimental questionnaire indicates that about a half of the subjects expected cheating to be present and leading to about 21-30% extra points. That is striking in contrast with the actual results.

Finally, it could be possible that the expected reward in dice rolling task of roughly 70 CZK was not appealing enough to elicit cheating (which could have led to max. 120 CZK). The value of incentives may influence one's behavior in cooperation or honesty-related tasks (Novakova & Flegr 2013). On the other hand, i.e. Nazar et al. (2008) reported that people are generally more prone to engage in dishonest activities if the stakes are low, as it does not impede their positive view of self. It is also possible that different tasks than dice rolling, despite its wide successful use, could be more suitable for studying subtle variations in dishonest behavior. More studies of varying designs focusing on (not exclusively) post-communist countries would also bring light onto this question.

Due to the low power of the study and low cheating rates, we were unable to determine factors mediating the tendency to cheat, therefore our results of their null influence are not fully conclusive and potential mediators of cheating would require a follow-up study with a larger subject sample.

7.5 Conclusion

While some previous studies had shown increased rates of various dishonest and cheating behavior in post-communist countries, our results suggest that the situation is not as simple as that. We found very low levels of cheating in the sample of Czech students. We also did not detect any significant difference between cheating in the control and experimental group (playing separately from others in their boxes and therefore having higher incentives to cheat). Nor did we find any stable significant effect of supposed explanatory variables such as gender, cognitive reflection, temporal discounting, risking and prosocial behavior in experimental games. We consider it useful to obtain experimental data for populations of more post-communist countries, leading to the possibility of a meta-study in the ideal case, to help uncover the effects of a country's recent political past on the (dis)honesty norms prevalent in its population.

7.6 References

- Algan, Y., & Cahuc, P. (2010). Inherited Trust and Growth. *The American Economic Review*, 100(5), 2060-2092.
- Ariely, D., Garcia-Rada, X., Hornuf, L., & Mann, H. (2014). The (true) legacy of two really existing economic systems. *Munich Discussion Paper*
- Balliet, D., & Van Lange, P. A. (2013). Trust, punishment, and cooperation across 18 societies A Meta-Analysis. *Perspectives on Psychological Science*, 8(4), 363-379.
- Bardsley, N. (2005). Altruism or artefact? A note on dictator game giving. *Working paper no. 2005-10*.
- Barfort, S., Harmon, N., Hjorth, F., & Olsen, A. L. (2015). Dishonesty and Selection into Public Service in Denmark: Who Runs the World's Least Corrupt Public Sector? *Discussion paper no. 15-12*.
- Barr, A., & Serra, D. (2010). Corruption and culture: An experimental analysis. *Journal of Public Economics*, 94(11-12), 862-869.
- Berg, J., Dickhaut, J., & McCabe, K. (1995). Trust, reciprocity, and social history. *Games and economic behavior*, 10(1), 122-142.
- Bjørnskov, C. (2007). Determinants of generalized trust: A cross-country comparison. *Public choice*, 130(1-2), 1-21.
- Blanco, M., Engelmann, D., & Normann, H. T. (2011). A within-subject analysis of other-regarding preferences. *Games and Economic Behavior*, 72(2), 321-338.
- Camerer, C. (2003). *Behavioral game theory: Experiments in strategic interaction*. Princeton University Press.
- Cohn, A., Fehr, E., & Maréchal, M. A. (2014). Business culture and dishonesty in the banking industry. *Nature*, 516, 86-89.
- Cox, J. C., Sadiraj, K., & Sadiraj, V. (2002). Trust, Fear, Reciprocity, and Altruism. *Working paper*.
- Fischbacher, U., & Föllmi-Heusi, F. (2013). Lies in disguise—an experimental study on cheating. *Journal of the European Economic Association*, 11(3), 525-547.
- Fisman, R., & Miguel, E. (2007). Corruption, norms, and legal enforcement: Evidence from diplomatic parking tickets. *Journal of Political economy*, 115(6), 1020-1048.
- Forsythe, R., Horowitz, J. L., Savin, N. E., & Sefton, M. (1994). Fairness in simple bargaining experiments. *Games and Economic behavior*, 6(3), 347-369.
- Friesen, L., & Gangadharan, L. (2012). Individual level evidence of dishonesty and the gender effect. *Economics Letters*, 117(3), 624-626.

- Furtado, D., Marcén, M., & Sevilla, A. (2013). Does Culture Affect Divorce? Evidence From European Immigrants in the United States. *Demography*, 50(3), 1013-1038.
- Giuliano, P. (2007). Living arrangements in western Europe: does cultural origin matter? *Journal of the European Economic Association*, 5(5), 927-952.
- Güth, W., Schmittberger, R., & Schwarze, B. (1982). An experimental analysis of ultimatum bargaining. *Journal of economic behavior & organization*, 3(4), 367-388.
- Güth, W., & Van Damme, E. (1998). Information, strategic behavior, and fairness in ultimatum bargaining: An experimental study. *Journal of Mathematical Psychology*, 42(2), 227-247.
- Hanna, R., & Wang, S. Y. (2013). Dishonesty and Selection into Public Service. *National Bureau of Economic Research No. w19649*.
- Hauk, E., & Saez-Marti, M. (2002). On the cultural transmission of corruption. *Journal of Economic Theory*, 107(2), 311-335.
- Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., & McElreath, R. (2001). In Search of Homo Economicus: Behavioral Experiments in 15 Small-Scale Societies. *The American Economic Review*, 91(2), 73-78.
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world?. *Behavioral and brain sciences*, 33(2-3), 61-83.
- Herrmann, B., Thöni, C., & Gächter, S. (2008). Antisocial punishment across societies. *Science*, 319(5868), 1362-1367.
- Hjöllund, L., Paldam, M., & Svendsen, G. T. (2001). Social capital in Russia and Denmark: A comparative study. *Working paper of Department of Economics, Faculty of Business Administration, Aarhus School of Business*.
- Hrabak, M., Vujaklija, A., Vodopivec, I., Hren, D., Marušić, M., & Marušić, A. (2004). Academic misconduct among medical students in a post-communist country. *Medical education*, 38(3), 276-285.
- Innes, R., & Mitra, A. (2009). Is dishonesty contagious? An experiment. *Working paper, available at SSRN 1426002*.
- Kagel, J. H., & Wolfe, K. W. (2001). Tests of fairness models based on equity considerations in a three-person ultimatum game. *Experimental Economics*, 4(3), 203-219.
- Knez, M. J., & Camerer, C. F. (1995). Outside options and social comparison in three-player ultimatum game experiments. *Games and Economic Behavior*, 10(1), 65-94.
- Kuběna, A. A., Houdek, P., Lindová, J., Příplatová, L., & Flegr, J. (2014). Justine effect: punishment of the unduly self-sacrificing cooperative individuals. *PLoS one*, 9(3), e92336.

- List, J. A. (2007). On the interpretation of giving in dictator games. *Journal of Political Economy*, 115(3), 482-493.
- Mazar, N., Amir, O., & Ariely, D. (2008). The dishonesty of honest people: A theory of self-concept maintenance. *Journal of marketing research*, 45(6), 633-644.
- McTernan, M., Love, P., & Rettinger, D. (2014). The influence of personality on the decision to cheat. *Ethics & Behavior*, 24(1), 53-72.
- Muehlheusser, G., Roider, A., & Wallmeier, N. (2015). Gender differences in honesty: Groups versus individuals. *Economics Letters*, 128, 25-29.
- Novakova, J., & Flegr, J. (2013). How much is our fairness worth? The effect of raising stakes on offers by proposers and minimum acceptable offers in dictator and ultimatum games. *PLoS one*, 8(4), e60966.
- Pascual-Ezama, D., Fosgaard, T. R., Cardenas, J. C., Kujal, P., Veszteg, R., Gil-Gómez de Liaño, B., Gunia, B., Weichselbaumer, D., Proestakis, A., Tira, M.D., Pratomo, Y., Jaber-López, T., Brañas-Garza, P. (2015). Context-dependent cheating: Experimental evidence from 16 countries. *Journal of Economic Behavior & Organization*, 116, 379-386.
- Ponti, G. B., & Rodriguez-Lara, I. (2015). Social Preferences and Cognitive Reflection: Evidence from Dictator Game Experiment. *Frontiers in Behavioral Neuroscience*, 9, 146.
- Rigby, D., Burton, M., Balcombe, K., Bateman, I., & Mulatu, A. (2015). Contract cheating & the market in essays. *Journal of Economic Behavior & Organization*, 111, 23-37.
- Ruffle, B. J., & Tobol, Y. (2015). Clever Enough to Tell the Truth. *Working paper*, available at SSRN 2656755.
- Sobell, V. (1987). Czechoslovakia: the legacy of normalization. *East European Politics & Societies*, 2(1), 35-68.
- Vranka, M. A., & Houdek, P. (2015). Many faces of bankers' identity: how (not) to study dishonesty. *Frontiers in psychology*, 6(302).
- Zizzo, D. J. (2010). Experimenter demand effects in economic experiments. *Experimental Economics*, 13(1), 75-98.

8. Příloha č. 2 – Cheating Consumers in Grocery Stores: A Field Experiment on Dishonesty

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Abstract

Purpose:

The study measured how often were customers cheated in real transactions. We have also examined if the attention paid by customers, the daytime of a transaction, and the gender of customers and cashiers affect the probability of cashiers' cheating.

Design/Methodology/Approach:

In a field experiment, hired confederates of both genders posed as tourists unfamiliar with local currency. They were buying small items in randomly selected grocery stores ($N = 319$). During the payment, the confederates made possible for the cashiers to take more money than they were supposed to. In randomly selected store visits, the confederates were using their phones during the payment and ostentatiously paid no attention to how much money was taken by the cashiers, therefore reducing the probability of cheating detection. The daytime of the store visits was randomized: a half of visits took place in the morning and a half of the visits took place in the evening.

Findings:

The customers were cheated in 20 % of stores. Median overcharge was 54 % of the value of an average purchase. In 3 % of stores cashiers took less money than was the actual purchase price; however median of such undercharges was only 2.7 % of the value of an average purchase. In the remaining 77 % of stores cashiers took the correct amount of money. As a whole, shoppers were cheated for 10.4 % of total value of purchased goods. We find no evidence that the probability of cheating was influenced by the attention paid by customers, or by the gender of either cashiers or customers. Despite our expectations, frequency of cheating was not higher in the evening than in the morning; our results rather indicate an opposite effect. These results are robust, even if we take into account the possibility of honest mistakes on the part of cashiers.

Implications:

Our results show that the cheating of consumers in grocery stores is relatively widespread, at least when cashiers have a relatively easy opportunity to cheat. The dishonest behavior of employees could eventually endanger the reputation of retail companies.

Originality/Value:

The field experiment provides more ecologically valid results than laboratory experiments or surveys for the estimation of the extent and identification of determinants of dishonesty. In comparison to similar laboratory-based studies we did not find that men behave less honest than women and that the dishonesty is greater in the evening or at lower risk of being caught.

Keywords:

dishonesty; cheated customers; field experiment; grocery stores

8.1 Introduction

Theft and embezzlement perpetrated by employees is a significant cause of financial loss for many companies. For example, US retailers suffer losses up to \$ 46 billion because of goods stolen by employees; as estimated by Ernst & Young (2003). According to other estimates, employee thefts are responsible for up to 30 % of bankruptcies and up to 70 % of inventory losses in the US that range from 6 to 200 billion dollars (Murphy, 1993; Wimbush & Dalton, 1997). About 75 % of retail employees state that they know colleagues who steal from their employers and 43 % of employees confess to stealing themselves (Slora, 1989).

How often retail employees steal from customers is, however, much less known. This kind of dishonest behavior does not necessarily cause companies direct costs, it can, however, jeopardize their public reputation, goodwill and image in eyes of customers and other stakeholders (Reuber & Fischer, 2010). When employees steal from customers, they usually do not leave any evidence of wrongdoing – unless the customers notice the theft right away – and such thefts are therefore very difficult to realize or prove (Zitzewitz, 2012). Available evidence suggests that dishonest behavior at the expense of customers could be relatively widespread (Rosenbaum, Billinger, & Stieglitz, 2014). For example, car mechanics use price discrimination based on how well are their customers knowledgeable about car repairs and they charge more or perform unnecessary repairs to less informed customers (Busse, Israeli, & Zettelmeyer, 2013; Schneider, 2012). Similarly, taxi drivers cheat tourists, offering them higher rates or driving them through unnecessarily long routes (Balafoutas, Beck, Kerschbamer, & Sutter, 2013); fish markets in India are overflowed by fishy deals (Dugar & Bhattacharya, 2016) and real estate brokers notoriously persuade their clients to sell their real estates too quickly and too cheaply (Levitt & Syverson, 2008). On the other hand, there are studies showing that employees sometimes behave exceedingly altruistic and helpful towards customers, sometimes even cheating for the customers' benefit: for example, many vehicle

emissions controllers illegally help drivers of ordinary cars, but are more strict with drivers of luxurious cars (Gino & Pierce, 2010). Other study shows that the majority of retail employees in Germany is honest despite the fact they undoubtedly have many opportunities to cheat their customers (Conrads, Ebeling, & Lotz, 2015).

In our field study, we use a variation of the over-payment paradigm in order to estimate the degree of dishonesty of retail employees. In the over-payment studies, confederates in a role of customers buy goods and pay a cashier more than was the marked price. An international comparative study employing the over-payment method (Feldman, 1968, experiment IV.) estimated that cashiers significantly cheat foreign tourists as well as local residents: from 27 % in Boston up to 54 % cashiers in Paris have kept the whole over-paid sum. Similar study conducted in Salzburg, Austria (Rabinowitz et al., 1993) examined whether employees of souvenir shops would keep an over-paid sum from a tourist and whether they would protest when the tourist pays too little. The results suggest that at least some over-payments kept by cashiers can be explained by fatigue, carelessness or inattention: there was no difference between number of noticed under-payments and number of returned over-payments. The only statistically significant finding of the study was that male confederates were cheated less. On the other hand, a Canadian study found that male customers are cheated more often by cashiers and younger cashiers are more prone to dishonesty than older employees (Gabor, Streat, Singh, & Varis, 1986). However, because of the relatively low number of observations in the Canadian study, the results are probably not very reliable. Moreover, it used design that does not allow to differentiate between a truly dishonest behavior and honest mistakes or omissions.

Our study expands the existing research literature in several ways: We have modified the procedure in order to eliminate confounding influence of honest mistakes caused by inattention or fatigue. In our study, confederates played a role of foreign tourists who paid by placing a handful of coins on a cashier's desk and asked cashier to pick up the correct amount. We measured dishonesty by observing whether the cashier picked the correct amount and if not, how much more (or less) did he or she take. In this way, any incorrect amount cannot be taken unintentionally as in previous studies.

We have also examined factors that could possibly influence the prevalence and intensity of dishonest behavior among retail employees. Namely, we have randomly varied gender of confederates and also have observed its interaction with cashiers' gender. Furthermore, we have varied the time of day for store visits (either in the morning or in the evening) and we experimentally manipulated if a confederate were occupied by a different task during the payment therefore lowering the chances of noticing potential cheating.

8.2 Factors influencing dishonesty

Gender differences in the propensity to engage in dishonest behavior and cheating are well documented. Despite the recent increase of women's criminality, men are responsible for most of thefts, violent crimes and other illegal activities (Kruttschnitt, 2013; Lauritsen, Heimer, & Lynch, 2009). According to current laboratory and field experiments, dishonest behavior is more intuitive for men (Fosgaard, Hansen, & Piovesan, 2013). Men are more willing to keep money that do not belong to them or which they gained by mistake (Azar, Yosef, & Bar-Eli, 2013; Friesen & Gangadharan, 2012). They more often free-ride in public transportation (Buccioli, Landini, & Piovesan, 2013) and they lie more in order to get a material gain for themselves (Dreber & Johannesson, 2008). However, it seems that when potential benefits of dishonest behavior are high enough, the gender difference tends to

disappear (Childs, 2012). Regarding victims of cheating and dishonest behavior, epidemiological and criminological studies are less clear. Nevertheless, it seems that disadvantaged groups like older or less educated people are cheated more often. Men are more often victims of high risk investment and property frauds, while women are targeted by “miracle health” and weight-loss scams and clairvoyant and psychic scams more often (Button, Lewis, & Tapley, 2009). Based on these findings, we expect that victims in our field study are more likely to be women and perpetrators are more likely to be men.

Besides gender, we also examine time of day as another factor potentially influencing dishonesty of employees. Despite recent controversies concerning the ego depletion theory (Carter & McCullough, 2013; Hagger & Chatzisarantis, 2016), making choices seems to deplete mental resources used for self-control during the day (Vohs et al., 2014). Because behaving in accordance with the legal and moral norms requires inhibiting dishonest impulses, especially in situations where the risk of getting caught is low, depleted self-control resources will lead to more dishonest and immoral behavior (Gino, Schweitzer, Mead, & Ariely, 2011). Based on these findings, Kouchaki & Smith (2014) predicted and in a series of four experiments demonstrated that the ability to resist temptation to act immorally decreases in a course of a day and people behave more dishonestly in the evening. The so-called Morning Morality Effect (MME) is also accentuated by situational factors, for example by less light in the evening (Chiou & Cheng, 2013). In our study, we therefore explore whether cashiers’ propensity to act dishonestly will be lower in the morning than in the late afternoon. Although we will not be able to observe exactly how long is any given cashier awake and how long has she been working, it does not constitute a serious limitation for our study, because the MME is supposed to be a consequence of being awake and we assume that cashiers working in the late afternoon are awake longer than cashiers working in the morning.

The probability of detecting fraud and dishonest behavior is potentially one of the most important variables influencing whether people act dishonestly or not (Becker, 1968). However, criminology and economic studies found mixed evidence regarding the influence of monitoring intensity (e.g., the size of police force) on abiding by the social norms and on the crime level (Nagin, 2013). On the other hand, empirical studies and case-studies usually show positive effect of monitoring on decrease of dishonest and illegal behavior, although the effect size depends on a variety of situational factors and personality characteristics (Belot & Schröder, 2016; Nagin, Rebitzer, Sanders, & Taylor, 2002; Pierce, Snow, & McAfee, 2015). In our experiment, we vary the intensity of monitoring of cashiers by confederates and therefore the subjective probability of detecting cashiers' cheating. We expect higher rate of cheating when monitoring and probability of detection is lower.

Our confederates played a role of tourists, group of people who could be viewed as disadvantaged in the given context because they lack knowledge of the foreign environment and its customs and do not speak the local language. Tourists are common victims of theft, fraud and scams, despite being aware of the increased risks (Harris, 2012; Tarlow, 2006). Our field experiment was conducted in Prague, the capital of the Czech Republic. Prague is a very popular tourist location with more than 6 million visitors each year, of which almost 90 % comes from abroad (Tourism, 2014). The experiment took place in summer, which is the peak of tourist season in Prague. In sum, this combination of factors should increase the overall incidence of dishonest behavior and therefore allows us to study the upper limits of propensity of retail employees to cheat customers.

8.3 Experiment

All used measures, procedure and analysis were pre-registered at OSF (<https://osf.io/c7tzh/>) before the start of the data collection, in accordance with current methodological recommendations (Open Science Community, 2014).

8.3.1 Pretest

Before the main study, we have conducted a pretest in order to verify whether cashiers experience cases similar to the scenario we intended to use; that is if customers sometimes ask cashiers to pick the correct amount of change for them.

Pretest consisted of an informal interview with cashiers in shops which were later excluded from the main study. We have interviewed 19 cashiers (17 female). Seventeen of them had an experience with the described situation. Their estimates of how often they encounter such situations varied from daily occurrences to occurring a few times a month. Tourists and seniors were two groups of customers named most often as behaving in the described way. The pretest has therefore established that our intended scenario is a commonly occurring, realistic situation.

8.3.2 Sample

Confederates: The confederates were four Czech university students (two female and two male) in their twenties. They wore T-shirts with a sign “I ♥ Prague” and spoke only English during their interaction with cashiers, therefore implying they are tourists who are not familiar with Czech money.

Participants: The participants were 319 cashiers (56 % female) in grocery and corner stores in the center area of Prague, the capital of Czech Republic. The stores were selected at random by the confederates walking through streets in assigned areas of Prague. The median estimate of age of cashiers was 35 years (ranging from 20 to 60 years).

8.3.3 Procedure

After entering a grocery store, a confederate picked one or two items (such as müsli bar or a can of soda) that cost approximately 40 CZK (~ \$ 1.66) and purchased them by placing a fistful of change on a desk in front of a cashier, telling him / her in English: “Sorry, I don’t know the change, can you pick it for me, please?”. Before entering a store, the confederate decided by flipping a coin whether he or she will be looking at a smartphone during the payment or not. After the cashier had picked the change, the assistant collected the rest of it, took the purchased item(s) and left the store. After leaving the store, the assistant took a note of the following variables: name of the store, its location, time of the visit, price of the purchased items, value of change left, number of other customers, number of cash desks, estimated age and gender of the cashier, his / her own gender and any additional notes concerning the interaction.

The change offered to cashier always consisted of coins of the following values: 3x 50 CZK; 4x 20 CZK; 3x 10 CZK; 4x 2 CZK; 3x 1 CZK (total value: 271 CZK). Each grocery store was visited only once; either in the morning (approx. between 9:00 – 11:00 AM) or in the evening (approx. between 6:00 – 8:00 PM).

8.3.4 Results

After exclusion of all instances in which the interaction did not occur according to the pre-registered protocol (e.g., other persons intervened during the interaction or the same store was visited for the second time by a different research assistant by mistake), 301 valid cases remained and the average value of a purchase was 37 CZK (SD = 6.5).

In 231 of these cases, cashiers took the correct amount of change. In 9 cases, a cashier took less than he or she should ($Med_{\text{undercharge}} = 1 \text{ CZK}$, $Max_{\text{undercharge}} = 6 \text{ CZK}$). In the remaining 61 cases (20.3%), cashiers overcharged research assistants ($Med_{\text{overcharge}} = 20 \text{ CZK}$, $Min_{\text{overcharge}} = 1 \text{ CZK}$, $Max_{\text{overcharge}} = 160 \text{ CZK}$). Therefore, the median overcharged amount

was 54% of the value of an average purchase. Total value of all purchased goods was 11,163 CZK and all confederates together were overcharged for 1,663 CZK, that is 10.4% of the total value.

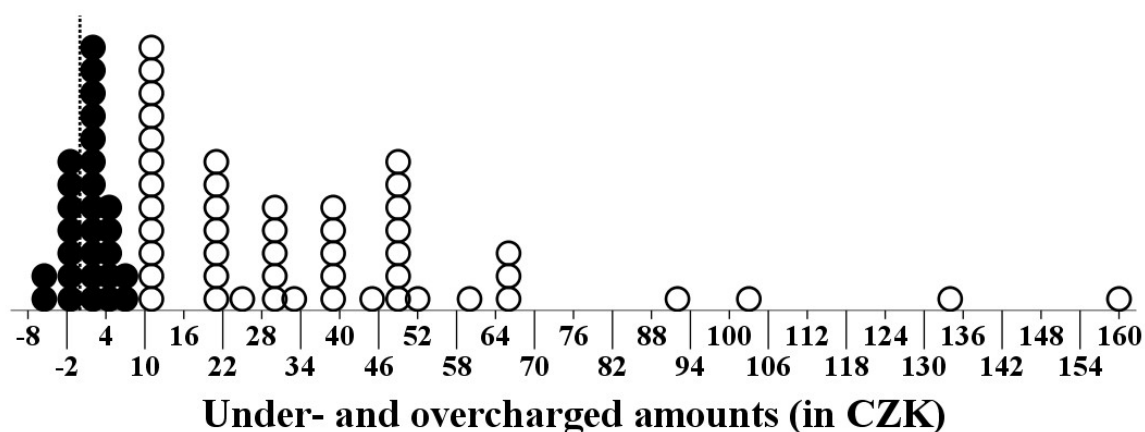


Figure 1. Distribution of under- and overcharged amounts (in CZK). Cases in which the correct amount was charged (231 cases, 76.7 %) are omitted. Probably “rounding mistakes”, i.e., amounts from –6 to +7 CZK are in black.

We conducted a probit regression with overcharging as a dichotomous dependent variable. In the first model, we used four binary predictors: whether confederates were not paying attention during the payment, whether the shop was visited in the morning, whether the customer was male and whether the cashier was male. The results can be found in Table 1. None of the predictors were significant and the overall model did not fit the data more than a null model $\chi^2(4) = 3.542, p = 0.47$. In the second model, we added a variable indicating whether customer and cashier were of the same gender and in the third model, we added predictors measuring cashiers’ age, age-squared and value of purchase. However, these two models were also not different from null model. The results suggest that none of the observed variables, neither paying attention, time of a day nor gender played any significant role in cashiers’ decision to cheat.

Table 1

Probit regression models predicting overcharging						
	Model 1		Model 2		Model 3	
	<i>b (SE)</i>	<i>p</i>	<i>b (SE)</i>	<i>p</i>	<i>b (SE)</i>	<i>p</i>
not paying attention	0.144 (0.168)	0.39	0.132 (0.169)	0.43	0.119 (0.171)	0.49
morning	0.201 (0.168)	0.23	0.215 (0.168)	0.20	0.208 (0.173)	0.23
male confederate	0.095 (0.166)	0.57	0.108 (0.167)	0.52	0.139 (0.169)	0.41
male cashier	0.213 (0.167)	0.20	0.204 (0.168)	0.23	0.246 (0.172)	0.15
different genders			-0.245 (0.167)	0.14	-0.273 (0.169)	0.11
age of cashier					0.117 (0.07)	0.09
age ² of cashier					-0.155 (0.094)	0.10
value of purchase					0.012 (0.013)	0.34
model fit (diff. from null)						
χ^2 (df)	3.542 (4)	0.47	5.713 (5)	0.34	9.829 (8)	0.28
Nagelkerke R^2	0.018		0.030		0.051	

We can consider a small fraction of the overcharges not as true cheating, but instead as rounding “mistakes”, based on the fact that cashiers sometimes undercharged by a small amount (at most 6 CZK) as well. When using instances of undercharging as an indicator, we can safely assume that all cases when confederates were overcharged for 10 and more CZK constitutes cheating. There were 43 such cases (14.3%).

Because our initial analysis mixed together cheating with cases that were probably just results of rounding, we repeated the probit regression analysis with an occurrence of cheating for 10 and more CZK as a dependent variable (see Table 2).

Table 2

Probit regression models predicting overcharging of 10 and more CZK						
	Model 1		Model 2		Model 3	
	<i>b</i> (SE)	<i>p</i>	<i>b</i> (SE)	<i>p</i>	<i>b</i> (SE)	<i>p</i>
not paying attention	0.019 (0.185)	0.92	-0.002 (0.187)	0.99	-0.013 (0.19)	0.95
morning	0.329 (0.187)	0.08	0.355 (0.189)	0.06	0.357 (0.195)	0.07
male confederate	0.124 (0.185)	0.50	0.172 (0.19)	0.37	0.198 (0.193)	0.30
male cashier	0.053 (0.188)	0.78	0.024 (0.192)	0.90	0.065 (0.195)	0.74
different genders			-0.349 (0.191)	0.07	-0.376 (0.193)	0.05
age of cashier					0.105 (0.078)	0.18
age ² of cashier					-0.137 (0.105)	0.19
value of purchase					0.013 (0.014)	0.35
model fit (diff. from null)						
χ^2 (df)	3.642 (4)	0.46	7.036 (5)	0.22	10.183 (8)	0.25
Nagelkerke R^2	0.023		0.044		0.063	

Once again, no model achieved statistical significance. However, it seems that confederates were probably more likely to be cheated in the morning than in the late afternoon ($b = 0.357$, $p = 0.07$). This effect is in the opposite direction that we expected. Also when genders of cashier and customer differed, the probability of overcharging was little bit lower ($b = -0.376$, $p = 0.05$). Nevertheless, both of these results are not significant and therefore very well compatible with nil effects of time of day and gender interaction.

8.4 Discussion

Our study estimated that cashiers cheat customers fairly often: cheating occurred in 20.3 % of all transactions. If we count as cheating only cases when customers were over-charged for more than 10 CZK (~ \$ 0.42), the rate of cheating was still considerably high at 14.3 %. Cheating cashiers over-charged usually about 50 % of the price of bought goods, however in four out of 301 cases cashiers over-charged from 100 % to 400 %.

In comparison with previous studies, we can rule out cashiers' inattention as a cause of over-charging customers. The confederates paid cashiers by offering them a fistful of change in a nominal value approximately four times higher than was the price of bought goods. From these coins, each cashier had to pick the amount that the customer was supposed to pay, which forced cashiers to pay sufficient attention. In this way, we have eliminated the possibility that some cases of over-charging were in fact mistakes caused by cashiers' inattention. Nevertheless, it seems that small rounding errors still happened in a fraction of cases: nine times out of 301 cases, cashiers under-charged an equivalent of up to \$ 0.25 and twice as often they over-charged up to the same amount. Plausible explanation may be that cashiers were unwilling to carefully search through all the coins in order to find the exact correct amount and they simplified their task by rounding. Although they took smaller amount in some cases, rounding up at the expense of a customer was more likely. Because these small over-charged might be motivated more by laziness than by dishonesty, we conducted an additional analysis in which we included only case of over-charging of 10 CZK (~ \$ 0.42) and more. The results, however, did not substantially differ.

We found no evidence of relation between gender and dishonest behavior: gender of a cashier was not related to the probability of over-charging and gender of a customer did not predict whether he or she will be cheated. When genders of cashier and customer differed, the

probability of cheating was little bit lower, however not significantly. These results are in line with mixed findings of previous studies (Gabor, et al., 1986; Rabinowitz, et al., 1993) that examined role of gender on dishonesty in similar situations. Therefore, it seems there is no clear and robust relationship between gender and cheating in the retail environment.

Our experiment can be considered a direct field examination of the Morning Morality Effect (MME), according to which employees deplete their self-regulatory capacities during the day and they are therefore unable to act according to moral rules when faced with tempting opportunity to cheat in the evening (Kouchaki & Smith, 2014). However, the hypothesis that cashiers behave more dishonest in the evening than in the morning was not supported. Our results suggest either there is no effect of daytime or that the effect is in fact in the opposite direction. Our results are in line with a series of recent studies that question the existence of self-control depletion that should underlie the MME. These studies show that the self-control depletion may be a much less volatile phenomenon and therefore of little practical consequences for business practice (Carter & McCullough, 2013, 2014; Hagger & Chatzisarantis, 2016; Lurquin et al., 2016); however, see different studies that provide evidence for the effect (Barnes, Schaubroeck, Huth, & Ghumman, 2011; Gino, et al., 2011).

Willingness to cheat customers was not affected by whether the customer was distracted by using his or her mobile phone or not. However, the results cannot be interpreted as evidence against the importance of detection probability for dishonest behavior. More probable explanation would be that the perceived probability of detection was so low even when the customer was not using a phone, that its further lowering could not have any significant effect. This results is in line with studies suggesting that when people are able to act dishonestly without the fear of punishment, superficial level of control does not affect their behavior (Northover, Pedersen, Cohen, & Andrews, 2016).

8.5 Practical Implications

We found relatively high prevalence of dishonest behavior among retail employees. Such behavior can negatively affect not only reputation of retail companies, but also the reputation of a city or a country as an attractive travel destination, considering that foreign tourists are often victims of cheating. The identified prevalence of cheating also suggests it is necessary to adopt effective counter-measures, such as closer monitoring of cashiers' work. Although some recent experimental studies suggest that increased monitoring may make employees less intrinsic motivated to perform their work, the studies also show that monitoring considerably lowers prevalence of dishonest behavior (Belot & Schröder, 2016; Pascual-Ezama, Prelec, & Dunfield, 2013; Pierce, et al., 2015). Various other tools for securing ethical conduct of employees can be also used: for example, personality tests and integrity tests could provide organizations with insight into employees' dispositions to unethical behavior, because results from these tests can be used to predict future dishonest behavior (Berry, Sackett, & Wiemann, 2007; McDaniel & Jones, 1988).

Our study also highlights the necessity of conducting field studies and employing mystery shopping in order to identify the true prevalence of dishonesty. Surprisingly, direct examination of employees' dishonesty is currently missing in most applications of mystery shopping (Finn & Kayandé, 1999; Frost & Rafilson, 1989; Gosselt, van Hoof, de Jong, & Prinsen, 2007; Wilson, 2001).

Finally, our study underscores current concerns about un-replicability of a large part of psychological results. The previously identified psychological effects are often difficult to replicate even in controlled laboratory setting (Open Science Collaboration, 2015). It can be therefore expected that their effect sizes will be even smaller in the real-world setting where

there are many interfering influences. Our study shows that the MME phenomenon may not be as strong as has been expected and does not affect behavior in real-life setting.

8.6 Study Limitations and Future Research

Although our overall sample with more than 300 visited grocery shops was sufficiently large, the dishonest behavior occurred only in the fraction of cases. The statistical power was therefore low for detecting smaller effects of the examined factors on dishonesty. It is still possible that gender, time of day and being distracted by mobile phone during the payment influence dishonesty of cashiers, however, it is not likely that these effects are very strong.

All of our findings are possibly limited by specifics of our study: by its setting (i.e., small grocery stores), by its location (i.e., capital of Czech Republic) and by the role played by confederates (i.e., foreign tourists). On the other hand, it can be reasonably expected that none of these factors should substantially interact with examined determinants of dishonesty. Furthermore, other studies suggest that the prevalence of a given kind of dishonest behavior is comparable between different countries (Pascual-Ezama et al., 2015). Although a recent German study (Conrads, et al., 2015) found evidence of lower scope of dishonesty among retail employees, the difference in results can be ascribed to the difference in used methodology: in our study cashiers had an opportunity to gain money from unsuspecting tourists for themselves, while in the study of Conrads et al. (2015) employees were able to over-charge customers only by incorrectly weighting loose candy that customers were buying. Because in the latter scenario, customers could easily spot larger over-weighting and cashier could not keep the over-charged amount for themselves anyway, we expect the motivation to cheat to be lower. However, in order to establish robustness of findings regarding the prevalence of dishonesty in the retail, further research in different countries and different settings (e.g., restaurants, department stores, etc.) is necessary.

One of shortcomings of field experiment study is a relatively limited scope of available data – we have access to data neither about corporate culture of visited stores nor about psychological traits and state of individual cashiers. All of these variables surely influence the propensity of employees to act dishonestly. Previous laboratory studies for example show that people cheat more if they are treated unfairly (Houser, Vetter, & Winter, 2012), when they experience monetary loss (Grolleau, Kocher, & Sutan, 2016), when they are rewarded non-transparently (Gill, Prowse, & Vlassopoulos, 2013), when they deliberately self-select for a setting that allows easier cheating (Gino, Krupka, & Weber, 2013) and many others (Lau, Wing Tung, & Ho, 2003). Cashiers are also relatively strongly influenced by productivity and work style of their colleagues (Mas & Moretti, 2009), which suggests that their propensity to dishonest behavior could be affected by prevalent behavior of their colleagues or by an organizational culture of the company for which they work (Vranka & Houdek, 2015). However, there are yet no studies examining effects of these factors on prevalence of dishonest behavior in real-life and could be therefore a subject of future research.

8.7 References

- Azar, O. H., Yosef, S., & Bar-Eli, M. (2013). Do customers return excessive change in a restaurant?: A field experiment on dishonesty. *Journal of Economic Behavior & Organization*, 93(0), 219-226. doi: 10.1016/j.jebo.2013.03.031
- Balafoutas, L., Beck, A., Kerschbamer, R., & Sutter, M. (2013). What Drives Taxi Drivers? A Field Experiment on Fraud in a Market for Credence Goods. *The Review of Economic Studies*, 80(3), 876-891. doi: 10.1093/restud/rds049
- Barnes, C. M., Schaubroeck, J., Huth, M., & Ghumman, S. (2011). Lack of sleep and unethical conduct. *Organizational Behavior and Human Decision Processes*, 115(2), 169-180. doi: 10.1016/j.obhdp.2011.01.009
- Becker, G. S. (1968). Crime and Punishment: An Economic Approach. *Journal of Political Economy*, 76(2), 169-217. doi: doi:10.1086/259394
- Belot, M., & Schröder, M. (2016). The Spillover Effects of Monitoring: A Field Experiment. *Management Science*, 62(1), 37-45. doi: doi:10.1287/mnsc.2014.2089
- Berry, C. M., Sackett, P. R., & Wiemann, S. (2007). A Review of recent developments in integrity test research. *Personnel Psychology*, 60(2), 271-301. doi: 10.1111/j.1744-6570.2007.00074.x
- Buccioli, A., Landini, F., & Piovesan, M. (2013). Unethical behavior in the field: Demographic characteristics and beliefs of the cheater. *Journal of Economic Behavior & Organization*, 93, 248-257. doi: 10.1016/j.jebo.2013.03.018
- Busse, M. R., Israeli, A., & Zettelmeyer, F. (2013). Repairing the Damage: The Effect of Price Expectations on Auto-Repair Price Quotes: National Bureau of Economic Research.
- Button, M., Lewis, C., & Tapley, J. (2009). Fraud typologies and the victims of fraud: literature review. London: National Fraud Authority.
- Carter, E. C., & McCullough, M. E. (2013). Is ego depletion too incredible? Evidence for the overestimation of the depletion effect. *Behavioral and Brain Sciences*, 36(6), 683-684. doi: 10.1017/S0140525X13000952
- Carter, E. C., & McCullough, M. E. (2014). Publication bias and the limited strength model of self-control: has the evidence for ego depletion been overestimated? *Frontiers in Psychology*, 5(823). doi: 10.3389/fpsyg.2014.00823
- Conrads, J., Ebeling, F., & Lotz, S. (2015). (Dis-)honesty: Measuring overcharging in a real-world market. *Journal of Behavioral and Experimental Economics*, 57, 98-102. doi: 10.1016/j.socec.2015.05.003
- Dreber, A., & Johannesson, M. (2008). Gender differences in deception. *Economics Letters*, 99(1), 197-199. doi: 10.1016/j.econlet.2007.06.027

- Dugar, S., & Bhattacharya, H. (2016). Fishy Behavior: Evaluating Preferences for Honesty in the Marketplace. *Available at SSRN 2726404*.
- Feldman, R. E. (1968). Response to compatriot and foreigner who seek assistance. *Journal of Personality and Social Psychology*, 10(3), 202-214.
- Finn, A., & Kayandé, U. (1999). Unmasking a phantom: a psychometric assessment of mystery shopping. *Journal of Retailing*, 75(2), 195-217. doi: 10.1016/S0022-4359(99)00004-4
- Fosgaard, T. R., Hansen, L. G., & Piovesan, M. (2013). Separating Will from Grace: An experiment on conformity and awareness in cheating. *Journal of Economic Behavior & Organization*, 93, 279-284. doi: 10.1016/j.jebo.2013.03.027
- Friesen, L., & Gangadharan, L. (2012). Individual level evidence of dishonesty and the gender effect. *Economics Letters*, 117(3), 624-626. doi: 10.1016/j.econlet.2012.08.005
- Frost, A. G., & Rafilson, F. M. (1989). Overt integrity tests versus personality-based measures of delinquency: an empirical comparison. *Journal of Business & Psychology*, 3(3), 269-277.
- Gabor, T., Strean, J., Singh, G., & Varis, D. (1986). Public deviance: An experimental study. *Canadian Journal of Criminology*, 28, 17-29.
- Gill, D., Prowse, V., & Vlassopoulos, M. (2013). Cheating in the workplace: An experimental study of the impact of bonuses and productivity. *Journal of Economic Behavior & Organization*, 96, 120-134. doi: 10.1016/j.jebo.2013.09.011
- Gino, F., Krupka, E. L., & Weber, R. A. (2013). License to Cheat: Voluntary Regulation and Ethical Behavior. *Management Science*, 59(10), 2187-2203. doi: 10.1287/mnsc.1120.1699
- Gino, F., & Pierce, L. (2010). Robin Hood under the hood: Wealth-based discrimination in illicit customer help. *Organization Science*, 21(6), 1176-1194.
- Gino, F., Schweitzer, M. E., Mead, N. L., & Ariely, D. (2011). Unable to resist temptation: How self-control depletion promotes unethical behavior. *Organizational Behavior and Human Decision Processes*, 115(2), 191-203. doi: 10.1016/j.obhdp.2011.03.001
- Gosselt, J. F., van Hoof, J. J., de Jong, M. D. T., & Prinsen, S. (2007). Mystery Shopping and Alcohol Sales: Do Supermarkets and Liquor Stores Sell Alcohol to Underage Customers? *Journal of Adolescent Health*, 41(3), 302-308. doi: 10.1016/j.jadohealth.2007.04.007
- Grolleau, G., Kocher, M. G., & Sutan, A. (2016). Cheating and Loss Aversion: Do People Cheat More to Avoid a Loss? *Management Science*. doi: 10.1287/mnsc.2015.2313

- Hagger, M. S., & Chatzisarantis, N. L. D. (2016). A Multilab Preregistered Replication of the Ego-Depletion Effect. *Perspectives on Psychological Science*, 11(4), 546-573. doi: 10.1177/1745691616652873
- Harris, L. C. (2012). 'Ripping off' tourists: An Empirical evaluation of tourists' perceptions and service worker (mis)behavior. *Annals of Tourism Research*, 39(2), 1070-1093. doi: 10.1016/j.annals.2011.12.002
- Houser, D., Vetter, S., & Winter, J. (2012). Fairness and cheating. *European Economic Review*, 56(8), 1645-1655. doi: 10.1016/j.euroecorev.2012.08.001
- Childs, J. (2012). Gender differences in lying. *Economics Letters*, 114(2), 147-149. doi: 10.1016/j.econlet.2011.10.006
- Chiou, W.-B., & Cheng, Y.-Y. (2013). In broad daylight, we trust in God! Brightness, the salience of morality, and ethical behavior. *Journal of Environmental Psychology*, 36, 37-42. doi: 10.1016/j.jenvp.2013.07.005
- Kouchaki, M., & Smith, I. H. (2014). The Morning Morality Effect: The Influence of Time of Day on Unethical Behavior. *Psychological Science*, 25(1), 95-102. doi: 10.1177/0956797613498099
- Kruttschnitt, C. (2013). Gender and Crime. *Annual Review of Sociology*, 39(1), 291-308. doi: 10.1146/annurev-soc-071312-145605
- Lau, V. C. S., Wing Tung, A., & Ho, J. M. C. (2003). A qualitative and quantitative review of antecedents of counterproductive behavior in organizations. *Journal of Business & Psychology*, 18(1), 73-99.
- Lauritsen, J. L., Heimer, K., & Lynch, J. P. (2009). Trends in the gender gap in violent offending: new evidence from the national crime victimization survey. *Criminology*, 47(2), 361-399. doi: 10.1111/j.1745-9125.2009.00149.x
- Levitt, S. D., & Syverson, C. (2008). Market Distortions When Agents Are Better Informed: The Value of Information in Real Estate Transactions. *Review of Economics and Statistics*, 90(4), 599-611. doi: 10.1162/rest.90.4.599
- Lurquin, J. H., Michaelson, L. E., Barker, J. E., Gustavson, D. E., von Bastian, C. C., Carruth, N. P., & Miyake, A. (2016). No Evidence of the Ego-Depletion Effect across Task Characteristics and Individual Differences: A Pre-Registered Study. *PLoS ONE*, 11(2), e0147770. doi: 10.1371/journal.pone.0147770
- Mas, A., & Moretti, E. (2009). Peers at Work. *The American Economic Review*, 99(1), 112-145.
- McDaniel, M. A., & Jones, J. W. (1988). Predicting employee theft: A quantitative review of the validity of a standardized measure of dishonesty. *Journal of Business and Psychology*, 2(4), 327-345.

- Murphy, K. R. (1993). *Honesty in the workplace*. Belmont, CA: Thomson Brooks/Cole Publishing Co.
- Nagin, D. S. (2013). Deterrence: A Review of the Evidence by a Criminologist for Economists. *Annual Review of Economics*, 5(1), 83-105. doi: 10.1146/annurev-economics-072412-131310
- Nagin, D. S., Rebitzer, J. B., Sanders, S., & Taylor, L. J. (2002). Monitoring, Motivation, and Management: The Determinants of Opportunistic Behavior in a Field Experiment. *American Economic Review*, 92(4), 850-873. doi: 10.1257/00028280260344498
- Northover, S. B., Pedersen, W. C., Cohen, A. B., & Andrews, P. W. (2016). Artificial surveillance cues do not increase generosity: two meta-analyses. *Evolution and Human Behavior*. doi: 10.1016/j.evolhumbehav.2016.07.001
- Open Science Collaboration (2015). Estimating the reproducibility of psychological science. *Science*, 349(6251), 943. doi: 10.1126/science.aac4716
- Open Science Community (2014). Maximizing the reproducibility of your research. In S. O. Lilienfeld & I. D. Waldman (Eds.), *Psychological Science Under Scrutiny: Recent Challenges and Proposed Solutions*. New York, NY: Wiley.
- Pascual-Ezama, D., Fosgaard, T. R., Cardenas, J. C., Kujal, P., Veszteg, R., Gil-Gómez de Liaño, B., . . . Brañas-Garza, P. (2015). Context-dependent cheating: Experimental evidence from 16 countries. *Journal of Economic Behavior & Organization*, 116, 379-386. doi: dx.doi.org/10.1016/j.jebo.2015.04.020
- Pascual-Ezama, D., Prelec, D., & Dunfield, D. (2013). Motivation, money, prestige and cheats. *Journal of Economic Behavior & Organization*, 93(0), 367-373. doi: 10.1016/j.jebo.2013.03.015
- Pierce, L., Snow, D. C., & McAfee, A. (2015). Cleaning House: The Impact of Information Technology Monitoring on Employee Theft and Productivity. *Management Science*, 61(10), 2299-2319. doi: doi:10.1287/mnsc.2014.2103
- Prague City Tourism (2014). *2014 Annual Report*. Praha.
- Rabinowitz, F. E., Colmar, C., Elgie, D., Hale, D., Niss, S., Sharp, B., & Sinclitico, J. (1993). Dishonesty, Indifference, or Carelessness in Souvenir Shop Transactions. *The Journal of Social Psychology*, 133(1), 73-79. doi: 10.1080/00224545.1993.9712120
- Reuber, A. R., & Fischer, E. (2010). Organizations Behaving Badly: When Are Discreditable Actions Likely to Damage Organizational Reputation? *Journal of Business Ethics*, 93(1), 39-50. doi: 10.1007/s10551-009-0180-3
- Rosenbaum, S. M., Billinger, S., & Stieglitz, N. (2014). Let's be honest: A review of experimental evidence of honesty and truth-telling. *Journal of Economic Psychology*, 45, 181-196. doi: 10.1016/j.joep.2014.10.002

- Schneider, H. S. (2012). Agency Problems and Reputation in Expert Services: Evidence from Auto Repair. *The Journal of Industrial Economics*, 60(3), 406-433. doi: 10.1111/j.1467-6451.2012.00485.x
- Slora, K. B. (1989). An empirical approach to determining employee deviance base rates. *Journal of Business and Psychology*, 4(2), 199-219.
- Tarlow, P. E. (2006). Crime and tourism. In J. Wilks, D. Pendergast & P. Leggat (Eds.), *Tourism in turbulent times* (pp. 93-105). New York: Elsevier.
- Vohs, K. D., Baumeister, R. F., Schmeichel, B. J., Twenge, J. M., Nelson, N. M., & Tice, D. M. (2014). Making choices impairs subsequent self-control: A limited-resource account of decision making, self-regulation, and active initiative. *Motivation Science*, 1(S), 19-42. doi: 10.1037/2333-8113.1.S.19
- Vranka, M. A., & Houdek, P. (2015). Many Faces of Bankers' Identity: How (not) to study dishonesty. *Frontiers in Psychology*, 6(302). doi: 10.3389/fpsyg.2015.00302
- Wilson, A. M. (2001). Mystery shopping: Using deception to measure service performance. *Psychology and Marketing*, 18(7), 721-734. doi: 10.1002/mar.1027
- Wimbush, J. C., & Dalton, D. R. (1997). Base rate for employee theft: Convergence of multiple methods. *Journal of Applied Psychology*, 82(5), 756.
- Young, E. (2003). *Ernst & Young Estimates Retailers Lose \$46 Billion Annually to Inventory Shrinkage*. Chicago, IL.
- Zitzewitz, E. (2012). Forensic economics. *Journal of Economic Literature*, 50(3), 731-769. doi: 10.1257/jel.50.3.731