Reactance Towards Automated Technology of the 21st Century

Sean Noble
Department of Psychology
Xavier University
3800 Victory Parkway
Cincinnati, Ohio 45207 USA

Faculty Advisor: Dr. Christian End

Abstract

The current study hypothesized, in accordance with previous research[2,3], that students confronted with a threat to their chosen career path (automated labor) would experience reactance, which would manifest as students being more motivated and more satisfied with their projected careers in comparison to students in a low threat-to-freedom condition. Additionally, this effect would be heightened in students naturally prone to reactance. Participants (N = 130) read one of two vignettes which used differentiated statistics (52% of experts believe automated labor will create jobs vs. 48% of experts believe automated labor will displace jobs) and amounts of threatening language (must consider vs. should consider) to describe automated labor. Participants then answered four scales designed to measure various forms of reactance and reactance response in relation to automated labor. The scales measured participants' perceived threat of automated labor[11] (α = .92), motivation to do well in their future career[14] (α = .91), satisfaction with career path[4,15] and trait reactance[8] (α = .84). An independent t-test was conducted on the perceived threat, motivation, and satisfaction scales. Contrary to the hypothesis, the results of the t-tests indicated that exposure to the high threat-to-freedom the motivation, t (128) = -0.91, p = .37, satisfaction, t (128) = -1.19, p = .46, and perceived threat, t (128) = -0.16, p = .88, condition were insignificant, resulting in similar effects as the low threat-to-freedom condition. Additionally, bivariate correlational analyses indicated that trait reactance and motivation, r (128) = -.02) as well as trait reactance and satisfaction with one's future career (r (128) = -.05) were not correlated. Further research should be conducted as automated labor becomes more prevalent in the workforce, to determine future changes in this relationship as the potential threat of automated labor becomes more salient to the general population.

Keywords: Reactance, Automation, Motivation

1. Introduction

Even as modern technologies create new jobs in America and abroad, so too do they present an ever-looming threat to the modern workforce. With the advent of increasingly advanced robotic technologies, automated labor is predicted to have a dramatic impact on the definition of work as it stands today[17]. While technology experts and members of the public are split on whether or not new technologies will create more jobs than they displace by the year 2025, experts agree that the current system of specialized education is doing little to prepare students for the automated revolution[17]. Students of higher education may find themselves currently specializing in white-collar fields which will soon be outsourced by automated labor. Automated labor therefore presents both the potential for unemployment, and a limitation on what career paths are viable in the future. The current study aims to examine if automated labor, presented as a threat to college students' career freedom, will induce reactance.

1.1. Automation as a Threat

Technology experts agree that new technologies will have dramatic impacts on the future of the workforce. Smith and Anderson[17] sought out expert opinions on advances of artificial intelligence (AI) and robotics, and the impact they would have on the workforce by 2025. Researchers canvassed the opinions of 1,896 participants including technology experts previously identified by the Pew Research Center, prominent Internet analysts, and those select members of the public who closely follow technology trends. Participants responded to a question about the economic impact of AI and robotics by 2025, specifically if they will create more jobs than they will displace. Forty-eight percent of participants responded that automated labor will outsource a greater amount of blue-collar and white-collar jobs than they create, leading to a future where many workers are simply unemployable[17]. Those on both sides of the issue agreed that the current education system is doing little to prepare future members of the workforce, and without a shift the automated revolution could render college graduates who chose certain career paths effectively unemployable.

1.2. Reactance as a Response to Threat

For many, the advent of automated labor is likely to be seen as a threat to freedom, making it important to understand how individuals respond to those threats. Sensenig and Brehm[16] conducted a study to test Brehm's theory of reactance[16], or attitude change in response to a threat to freedom of opinion. Ninety-nine female students participated in the study. Pairs of participants completed five essays, each essay supporting a single stance on one of five controversial issues. The first participant ultimately decided which stance both participants would endorse on each issue. The first participant either asked her partner's stance on all issues (control), decided the other partner's stance on *one* of the issues (low threat-to-freedom), or decided the other partner's stance on all *five* of the issues (high threat-to-freedom). After writing the essay, researchers then measured the second participant's attitude toward the first participant's viewpoint. It was discovered that the higher the threat to freedom that the second participant was exposed to, the less likely she was to support the first participant's viewpoint. The study demonstrated that if a participant's freedom of opinion is threatened they will experience reactance, or a motivational change to restore that freedom; in this case, manifested as an attitude against the assigned viewpoint.

If a threat to freedom of opinion can elicit reactance, then it is possible that threats to other freedoms can elicit reactance as well. Kirchler[10] studied employers' reactions towards taxes. Kirchler argued that taxes function as a limitation on employers' freedom to make decisions about their income. Kirchler speculated that these employers would manifest reactance in the form of negative attitudes and behaviors against taxes. One-hundred seventeen employers completed a questionnaire regarding, perceived loss of freedom due to taxes and actions taken to reduce or avoid taxes. Researchers performed factor analysis on the questionnaire with varimax rotation to synthesize the data. Researchers discovered, in support of the hypothesis, that perceived loss of freedom was correlated with anti-tax attitudes and approval of tax avoidance. Employers that perceived taxes as a threat to freedom experience reactance against taxes. As a result of the study, it can be assumed that reactance can occur towards any perceived threat towards freedom, not just freedom of opinion.

Researchers sought to demonstrate the theory of reactance in an academic setting, specifically examining college students. Ball and Goodboy[2] examined if college students respond to persuasive language in the classroom. Two-hundred six student participants read a vignette which gave examples of persuasive messages from faculty that were manipulated for clarity (high and low) and forceful language (high and low), and participants subsequently completed a questionnaire on the vignette regarding the participants' attitude toward the persuasive message. The hypothesis that use of forceful and controlling language was positively correlated with students' perceived threat was supported, along with the hypothesis that such language had an opposite as intended effect on students. The study suggested that when messages are perceived as attempting to control behavior, they ultimately discourage students from performing those behaviors

Though Ball and Goodboy[2] demonstrated that advisory messages perceived as controlling would have a "boomerang effect," the question remains as to how that reactance will manifest itself when that controlling message is presented is as an elimination of a choice rather than an encouragement of one. Brehm, Stires, Sensenig, and Shaban[3] conducted an experiment to examine if the elimination of a choice alternative would heighten the attractiveness of that alternative. Sixty-two male and female college students listened to four records, and then chose one record to take home with them as a gift the next day. Participants ranked the albums in terms of which one they would like to take home the most. The third most popular album of the four was then eliminated as a potential gift, and participants subsequently filled out a second questionnaire regarding which record they wanted the most. When the third most popular album

was eliminated from the choice alternatives, its ranking increased. The study suggested that when the freedom to make a choice is eliminated, reactance will manifest itself as making the eliminated choice more desirable.

1.3. Proneness to Reactance

In order to insure that perceived threat-to-freedom is responsible for participants' responses, it is worth identifying the extent to which participants are prone to reactance. Brehm et al.[3] originally asserted that reactance is not a measurable trait, Dillard and Shen[4] assessed the validity of measuring proneness to undergo reactance. Students ($N = 407$) between the ages of 18 and 32 years old read either two high threat-to-freedom or two low threat-to-freedom booklets which informed and advised behaviors in relation to flossing or binge drinking. Participants recorded their reactions and completed several other self-reporting measures regarding personal attitudes and behaviors related to flossing or binge drinking. Researchers, found support for their hypothesis that proneness to reactance could in fact be measured using well known and widely understood self-report methods, such as Hong's Reactance Scale[8]. The scale was able to accurately predict participants' proneness to reactance based on its correlation to manifested reactance effects. Methods of self-reported trait reactance were confirmed to be accurate in their assessment of those prone to reactance.

Just as some individuals are more prone to reactance than others, reactant individuals are more likely to possess certain personality traits, specifically concern for problems and the future, than non-reactant individuals. Dowd, Wallbrown, Sanders, and Yesenosky[6] examined the relationship between individuals' proneness to reactance and concern for problems and the future. Three hundred sixty-two graduate and undergraduate psychology students answered the Therapeutic Reactance Scale[5] and the Questionnaire for the Measurement of Psychological Reactance[13] to determine psychological reactance. Participants then completed the California Psychological Inventory-Revised[7] to determine concern for problems and the future. Researchers found that individuals prone to reactance (reactant individuals) were more concerned about problems and the future than non-reactant individuals.

To individuals prone to reactance, the importance of a concept to that provokes reactance determines the intensity of the reactance behavior. Malatincová[12] designed a study intending to determine the relation between college students' trait reactance and procrastination. Male and female Czech university students completed a total of three questionnaires on trait reactance[9], academic procrastination[1], and task delay and self-reported task procrastination. Researchers discovered that when certain high-trait reactance individuals' tasks were objectively more important than other tasks, reactance towards those tasks increased. Malatincová[12] therefore speculated that when reactant individuals deal with concepts deemed to be subjectively important they will exhibit greater reactance than when dealing with concepts deemed unimportant.

The current study seeks ultimately to examine if college students manifest reactance in response to automated labor when automated labor is presented as a threat to career freedom. As research has demonstrated, automated labor currently threatens to make many college graduates effectively unemployable as a result of their chosen career paths[17]. When presented with a threat to freedom an individual demonstrates reactance, or motivation to regain one's freedom of opinion in the face of a perceived threat to said freedom[16]. Kirchler's[10] research supports the notion that any threat to freedom, not just freedom of opinion, can elicit a reactance response. Additionally, college students already demonstrate reactance towards messages advising behaviors when those messages are perceived as threats to freedom, resulting in a "boomerang effect" against the advised behavior[2]. When these threats to freedom eliminate an option rather than advise an individual to choose an option, reactance manifests itself as making the eliminated option more desirable[3]. It is hypothesized, in accordance with Ball and Goodboy[2], that a high threat to one's previously chosen career path (i.e. freedom) presented in the form of automated labor will elicit greater reactance than a low threat also presented as automated labor. In accordance with Brehm et al.[3], higher reactance, in this case a greater desire for the choice perceived to be threatened, will manifest itself as students being both more motivated to do well in their chosen career path and more satisfied with their choice than those experiencing a lesser level of reactance.

Additionally, research by Dowd et al.[5] and Malatincová[12] support the idea that reactant individuals will place greater importance on their future career than non-reactant individuals. Reactant individuals will therefore demonstrate a strengthened correlation between career motivation and exposure to threat than non-reactant individuals, regardless of the level of threat.

2. Methodology

2.1. Participants

One hundred-thirty participants took part in the study which claimed to evaluate student reactions to new technologies in the workplace. All participants were undergraduate students from Xavier University and received 45 minutes of research credit for completing the study. The participants of the study were between the ages 18 and 57 years old ($M = 20.13$, $SD = 3.42$). The sample comprised of 75.4% female participants and 24.6% male participants. Caucasian participants composed 76.2% of the sample, African-American participants composed 7.7%, Hispanic participants made up 6.9%, Asian participants 4.6%, Multiracial participants 3.8% and the remaining 0.8% percent of participants identified as other. The most common major for participants was psychology, which 31.5% of participants identified as. The remaining majors were business majors at 13.8%, occupational therapy majors at 11.5%, media and communication majors at 10.8%, and all other majors added to form the remaining 32.4%. All participants completed the study in a standardized, pre-specified research room at Xavier University.

2.2. Materials

2.2.1. motivation to do well in future career

The motivation to do well in future career measure is adapted from a three-part career motivation scale ($M = 3.0$, $SD = 2.8$) used in prior research to examine views on motherhood and work-home culture[14]. The scale consists of 13 questions on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The scale has been truncated so that only career-oriented questions remain, and those questions have been slightly altered to apply instead to future careers and career paths instead of current careers (e.g. *I am very focused on my future career* instead of *I am very focused on my career*). Cronbach's alpha of the adapted scale was indicated to be .91.

2.2.2. satisfaction with career path

This measure is based off a 100-point single item estimate used in Dillard and Shen[4] and Richards and Banas[15] to estimate participants' self-reported intention to perform a behavior discouraged by the vignette. The scale is a single item 5-point Likert scale ranging from completely dissatisfied (1) to completely satisfied (5). For the purposes of the current study, the estimate has been changed to measure participants' self-reported satisfaction with their current projected career. It is included as the last question in the motivation scale self-report.

2.2.3. psychological reactance as a trait

Hong and Faeda[8] created this scale ($M = 3.2$, $SD = 1.17$) to measure differences in individual likelihood to undergo reactance when perceiving a threat to freedom, refining Hong and Page's[9] previous 14 response measure used in prior studies. The current measure is 11 responses rated on a five-factor Likert-type scale ranging from strongly disagree (1) to strongly agree (5). Analysis of the adapted scale has indicated a Cronbach's alpha of .84.

2.2.4. perceived threat-to-freedom

Perceived threat-to-freedom was measured to identify the strength of automated labor as an antecedent to reactance. The measure is a replication of a measure ($M = 3.9$, $SD = 1.38$) used research to identify perceived threat-to-freedom[11], with wording being slightly altered so that the measure applied to automated labor as a perceived threat (e.g., *this service will restrict my use of the website* became *automated labor will restrict my choice of career*). The measure is three questions rated on a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7). Cronbach alpha value of the adapted scale was determined to be .92.

2.3. Procedure

After all participants had arrived at the lab, experimenters informed them that the current study was created to evaluate student reactions to new technologies in the workplace. Participants were randomly assigned to either a high threat-to-freedom condition (experimental) or low threat-to-freedom condition (control). Participants first read and signed an informed consent form. Next, participants read one of two vignettes, which presented factual information on automated labor in either a high threat-to-freedom or low threat-to-freedom manner. Threat conditions are differentiated through the use of controlling and assertive language in the high threat-to-freedom condition. Controlling language is marked in bold lettering. Vignette structure and language were modeled off of Dillard and Shen's[4] high threat-to-freedom and low threat-to-freedom vignettes, which gave similar information on a subject, but used controlling and assertive language in high threat-to-freedom conditions. Students then completed self-report measures of motivation to do well in future career[14] and satisfaction with career path[4,15] a psychological reactance scale[8], and perceived threat-to-freedom[11]. Lastly, participants completed a demographics questionnaire, which included employment history, to avoid priming answers. Participants received a debriefing form before they left the lab.

3. Results

3.1. Manipulation Check

So as to confirm that participants in the high threat-to-freedom condition perceived a greater threat than participants in the low threat-to-freedom condition, a t-test was used to compare participants' responses to the perceived threat-to-freedom scale[11]. Inconsistent with the hypothesis, participants exposed to the high threat-to-freedom condition perceived similar levels of threat to their freedom to choose a career ($M = 3.15$, $SD = 1.73$) as participants exposed to the low threat-to-freedom condition ($M = 3.11$, $SD = 1.22$), $t (128) = -0.16$, $p = .88$.

3.2. Hypotheses Testing

In order to test if college students exposure to automated labor as a threat to career freedom were more motivated to do well in their projected careers, a t-test was used to compare participants' responses to a motivation to do well in future career scale[14]. Inconsistent with the hypothesis, participants exposed to automated labor in the high threat-to-freedom condition reported similar motivation to do well in their current projected career ($M = 3.92$, $SD = 0.66$) as participants exposed to automated labor in the low threat-to-freedom condition ($M = 3.82$, $SD = 0.66$), $t (128) = -0.91$, $p = .37$.

To test if college students exposure to automated labor as a threat to career freedom were more satisfied with their career path, a t-test was used to compare participants' responses to a satisfaction with career path scale[4,15]. Inconsistent with the hypothesis, participants exposed to automated labor in the high threat-to-freedom condition reported similar satisfaction with their career path ($M = 4.34$, $SD = 0.74$) as participants exposed to automated labor in the low threat-to-freedom condition ($M = 4.17$, $SD = 0.88$), $t (128) = -1.19$, $p = .46$.

In order to test the hypothesis that there is a positive relationship between trait reactance and career motivation, a bivariate correlational analysis was conducted on participants' scores on the reactance as a trait scale[8] and on the motivation to do well in future career scale[14]. Trait reactance scores failed to indicate correlation with motivation to do well in future career, $r (128) = -.02$, $p = .86$.

Finally, in order to test the hypothesis that there is a positive relationship between trait reactance and satisfaction with career path, a bivariate correlational analysis was conducted on participants' scores on the reactance as a trait scale[8] and on the satisfaction with career path scale[4,15]. Trait reactance scores failed to indicate correlation with motivation to do well in future career, $r (128) = -.05$, $p = .57$.

3.3. Exploratory Analysis

A *t*-test was used to determine if exposure to automated labor as a threat to career freedom affected trait reactance. It was determined that participants' exposed to automated labor in the high threat-to-freedom condition reported significantly higher trait reactance ($M = 3.05$, $SD = 0.49$) than participants exposed to automated labor in the low threat-to-freedom condition ($M = 2.83$, $SD = 0.52$), $t(128) = -2.56$, $p = .01$, $d = 0.45$.

Additionally, a bivariate correlational analysis was conducted on participants' employment status and motivation to do well in future career scale[14]. Employment status demonstrated a partially significant positive correlation with the motivation to do well in future career, $r(128) = .14$, $p = .12$. That is, those who were part-time or full-time employed scored higher on the motivation to do well in future career scale than those who were unemployed.

4. Discussion

The hypotheses of this study aimed to determine if the perception of automated labor as a threat to career freedom would produce reactance in college students. The primary hypothesis, that exposure to automated labor as a high threat to career freedom would induce higher motivation and satisfaction with one's future career, was unsupported by the results. Likewise, the secondary hypothesis, that higher levels of career motivation and satisfaction with participants' future career path would be positively correlated with trait reactance, remained unsupported by the results. However, an exploratory analysis revealed a significant relationship between exposure to automated labor as a threat to career freedom and trait reactance; that is, exposure to automated labor as a high threat-to-freedom resulted in higher trait reactance than as a low threat-to-freedom. A second exploratory analysis revealed a partially significant positive correlation between employment status and motivation to do well in future career.

A possible explanation for the lack of support for both the primary and secondary hypotheses is that automated labor as a threat to future career choice is too conceptual of a threat to induce an immediate reactance effect. Other studies examining the effects of reactance[2-4,10,12] dealt with activities and events which participants had experienced or would experience within a reasonably short period before or after the study. For most participants in the current study, their future career is not something they would experience for at least another year, many not until the next several. If participants have not fully imagined their future lives within the context of their future career, they would feel inherently less defensive about a threat to said career. The study was administered in the fall semester, and the vast majority of participants (85.4%) identified themselves as being in their junior year or earlier, meaning that most if not all participants were unlikely to have legitimate career prospects at the time of the study. The exploratory analysis finding that there exists a partially significant positive correlation between employment status and motivation to do well in future career lends support to this explanation. Additionally, participants may be hesitant to believe that their particular careers choices are threatened by automated labor, or they may believe that the problem will be fixed by the time they enter the workforce. The failure of the vignettes to produce a significant difference of perceived threat across conditions, as evidenced by the manipulation check, supports all three of these explanations. The concept of automated labor, while threatening or not, might not be immediately threatening enough to induce a significant reactance effect.

Another possible explanation for the failure to support the primary and secondary hypotheses is that, while automated labor as a threat to career freedom may induce reactance, the effect of that reactance might not be the measured variables of the current study. Though a purely speculative explanation, it is entirely possible, given that the exploratory analysis indicates there was a difference in reactance experienced across conditions, there was a reactance effect that either manifested itself differently than measured or in an immeasurable manner within the participant's mind. Future research attempting to explore the psychological effects of automated labor should therefore opt to examine participant reactions in a different manner.

Exploratory analysis demonstrated that participants exposed to the high threat-to-freedom condition exhibited significantly higher trait reactance. The reason for this effect is likely due to the difference in language between the vignettes. Based on the lack of statistical significance within other measures of the current study, which demonstrated that the concept of automated labor fails to induce a reactance effect, higher trait reactance occurs simply because of the controlling language within the high threat-to-freedom condition, not because of the content associated with that language. This explanation is supported by Dillard and Shen's[4] study, which used vignettes that demonstrated a difference in reactance effects as a result of controlling language. The current study uses the same controlling language found within those vignettes, swapping primarily the content rather than the language of the message across conditions. The results of this analysis further confirm the findings of Dillard and Shen's[4] study.

One possible limitation to the current study was that the language within the vignettes administered to participants may not have been controlling enough to induce the desired reactance effect. The vignettes themselves were never pilot tested and thus may lend themselves to being too similar in wording to produce the expected reactance effect. However, two factors exist to dispute this potential limitation. First, and as previously mentioned, the language used in the controlling vignette was heavily modelled off of Dillard and Shen's[4] vignettes, which successfully induced reactance effects in participants. Second, the researcher's explanation of the primary exploratory analysis would not be congruent with this limitation.

Another limitation to the study may be attributed a lack of employed students within the study. Nearly 38.5% of participants indicated that they were unemployed at the time of the study. As previously speculated, students may find automated labor unthreatening because they do not believe that it will have an impact on their careers. These findings might change, however, once students enter the workforce, and are more privy to the difficulty associated with obtaining and maintaining a professional career. The partial correlation between employment status and career motivation supports this idea. However, causation does not equal correlation, and it is possible that the partial correlation in question does not support this potential limitation. Regardless, future studies examining reactance towards automated labor may want to acquire a statistically significant amount of employed and unemployed participants, in order to account for employment status.

The real world applications for the current study lie primarily in the potential for further areas of research. The primary results of the current study indicate that college students remain relatively unthreatened by the notion of automated labor. This notion is further confirmed by the lack of correlation between career motivation and trait reactance. Other populations could be examined for incidence of the same expected effect, specifically populations more immediately threatened by automated labor, such as blue-collar and minimum wage workers. Additionally, colleges looking to increase future enrollment need not consider the future career validity of certain majors, as it does not appear to be a concern for college students in the foreseeable future. This finding may change once certain career paths become unviable as a result of automated labor, and future research should be conducted at that point in time. The finding that employment status is partially correlated with career motivation indicates several potential findings: students who find part-time or full-time jobs become more motivated to do well in their future careers, students who have part-time or full-time jobs are already more motivated to do well in future career, or that motivation to do well in future career encourages one to find a part-time or full-time job. Regardless, further research into this finding is necessary. Finally, the finding that exposure to automated labor as a high threat-to-freedom causes higher trait reactance than as a low threat-to-freedom condition further supports Dillard and Shen's[4] assertion that controlling language induces reactance.

5. Acknowledgements

6. References

1. Aitken, M.E. (1982). A personality profile of the college student procrastinator. *Dissertation Abstracts International*, *43*(3-A), 722-723.

2. Ball, H., & Goodboy, A. K. (2014). An experimental investigation of the antecedents and consequences of psychological reactance in the college classroom. *Communication Education, 63*(3), 192-209. doi:10.1080/03634523.2014.918634

3. Brehm, J. W., Stires, L. K., Sensenig, J., & Shaban, J. (1966). The attractiveness of an eliminated choice alternative. *Journal of Experimental Social Psychology, 2*(3), 301-313. doi:10.1016/0022-1031(66)90086-2

4. Dillard, J. P., & Shen, L. (2007). On the nature of reactance and its role in persuasive health communication. *Communication Monographs, 72*(2), 144-168. doi:10.1080/03637750500111815

5. Dowd, E. T., Milne, C. R., & Wise, S. L. (1991). The therapeutic reactance scale: A measure of psychological reactance. *Journal of Counseling and Development*, *69*, 541-545. doi: 10.1002/j.1556-6676.1991.tb02638.x

6. Dowd, E. T., Wallbrown, F., Sanders, D., & Yesenosky, J. M. (1994). Psychological reactance and its relationship to normal personality variables. *Cognitive Therapy and Research, 18*(6)*, 601-602. doi: 10.1007/BF02355671

7. Gough, H. G. (1987). *California Psychological Inventory Administrator's Guide*. Palo Alto, CA: Consulting Psychologists Press.

8. Hong, S.M., & Faedda, S. (1996). Refinement of the Hong psychological reactance scale. *Educational and Psychological Measurement, 56*(1), 173-182. doi:10.1037/t08336-000

9. Hong, S.M., & Page, S. (1989). A psychological reactance scale: Development, factor structure and reliability.

10. Kirchler, E. (1999). Reactance to taxation: Employers' attitudes towards taxes. *The Journal of Socio-Economics, 28*(2), 131-138. doi:10.1016/S1053-5357(99)00003-7

11. Lee, G., Lee, J., & Sanford, C. (2010). The roles of self-concept clarity and psychological reactance in compliance with product and service recommendations. *Computers in Human Behavior, 26*(6), 1481-1487. doi:10.1037/t12958-000

12. Malatincová, T. (2014). The mystery of "should": Procrastination, delay, and reactance in academic settings. *Personality and Individual Differences, 72*, 52-58 doi:10.1016/j.paid.2014.08.015

13. Merz, J. (1983). Fragebogen zur messung der psychologischen reaktanz [Questionnaire for the measurement of psychological reactance]. *Diagnostica, Band XXIX*, 75-82.

14. Pas, B., Peters, P., Eisinga, R., Doorewaard, H., & Lagro-Janssen, T. (2011). Explaining career motivation among female doctors in the Netherlands: The effects of children, views on motherhood and work-home cultures. *Work, Employment and Society, 25*(3), 487-505. doi:10.1037/t07260-000

15. Richards, A. S., & Banas, J. A. (2015). Inoculating against reactance to persuasive health messages. *Health Communication, 30*(5), 451-460. doi:10.1080/10410236.2013.867005

16. Sensenig, J., & Brehm, J. W. (1968). Attitude change from an implied threat to attitudinal freedom. *Journal of Personality and Social Psychology, 8*(4), 324-330. doi:10.1037/h0021241

17. Smith, A. & Anderson, J. (2014, August 6). AI, robotics, and the future of jobs. *The Pew Research Center*. Retrieved from http://www.pewinternet.org/2014/08/06/future-of-jobs/

18. Upbin, B. (2013, January 8). IBM's Watson gets its first piece of business in healthcare. *Forbes*. Retrieved from http://www.forbes.com/sites/bruceupbin/2013/02/08/ibms-watson-gets-its-first-piece-of-business-in-healthcare/