LIVING GIG TO GIG AND PAYCHEQUE TO PAYCHEQUE: HOW INCOME VOLATILITY AFFECTS FINANCIAL DECISIONS

Technical Report

Dr. Johanna Peetz
Dr. Jennifer Robson

THINK
FORWARD INITIATIVE

LIVING GIG TO GIG AND PAYCHEQUE TO PAYCHEQUE: HOW INCOME VOLATILITY AFFECTS FINANCIAL DECISIONS[*]

TECHNICAL REPORT

Dr. Johanna Peetz and Dr. Jennifer Robson [†]

February, 2021

Abstract

Across advanced economies, approximately one in six workers is self-employed and one in eight is on a temporary contract (OECD, 2018). Compared to traditional workers, these workers have a substantially more volatile income – it changes month-to-month depending on gigs obtained or hours assigned. This report outlines a set of three studies examining the role of income volatility, and control over this volatility, for financial decision making. In Study 1 (N=6,397), we document a negative association between secure work and financial strain and precarity during the COVID crisis, as well as an association between gig work and self-reported food insecurity. In Study 2 (N=982), we find that those with an uncontrollably volatile incomes reported more financial stress, less life satisfaction, and worse financial decisions, independent of amount of income or other demographic variables compared to those who reported control over the swings in their income or those with a stable income. In Study 3 (N=149) we report that participants who were assigned to work in an environment that simulated volatile income for about 30 minutes made worse financial decisions (choosing a lower immediate payout rather than a higher, delayed payout) compared to participants who were assigned to work in an environment that simulated stable income. This last study showed no significant differences based on control over the income volatility.

Keywords: Financial Decisions, Saving, Life Satisfaction, Income Volatility, Perceived Control

---

1. Introduction

In light of the economic uncertainty created by the COVID-19 global pandemic, governments and businesses are all trying to find ways to help people handle the unexpected shock. In many cases, household incomes will drop significantly or even stop as people stay away from work to care for family or isolate themselves from infection. In many countries, gig workers have been especially hard hit and do not always qualify for traditional public income support programs. For example, in Canada some 40% of people who took temporary emergency benefits for COVID would not qualify for benefits in the long-standing employment insurance system.

For better or worse, gig work is an important part of labor markets today and its prevalence may increase in the wake of the current global recession. Across advanced economies, approximately one in six workers is self-employed and one in eight is on a temporary contract (OECD, 2018). The Netherlands has the fourth highest share of temporary workers amongst all countries in the Organization for Economic Cooperation and Development (OECD) and has seen its share of self-employed workers rise significantly since 1996. In the United States, national statistics on gig workers suggest that gig work takes a wide range of forms, from contingent workers, independent contractors, on-call workers, temporary help agency workers and subcontractors of other firms (Bureau of Labor Statistics (BLS), 2018). In Canada, the share of the labor force participating in gig work rose from 5.5% to 8.2% between 2005 and 2016 (Jeon, Liu and Ostrovsky, 2019). This increase in gig work participation in Canada was shared by both men and women, but rose faster among new immigrants. Workers in the bottom 40% of the income distribution are twice as likely to engage in gig work and median gig work earnings are very low in Canada. Evidence from the U.S., however, does not show such a large gap in the total incomes of gig versus standard workers (BLS, 2018).

There are several reasons to believe that gig workers might face greater financial insecurity, including little or no access to work-related benefits and structural barriers to participation in public contributory insurance to provide, for example paid parental leave or retirement pensions (BLS, 2018; OECD, 2018). Compared to traditional salaried workers with stable hours of work, the month to month incomes of self-employed and contingent workers may be more unpredictable. That is a source of household financial risk we think merits far greater attention.

In this report, we present the results of three studies that, together, aim to address some of the key research questions on the incidence and effects of income volatility. We are particularly interested in the effects of psychological variables, namely perceptions of control, as mediating factors in the impacts of volatility on financial outcomes. In Study 1, we ask: Is income stability (the inverse of volatility) associated with more self-reported financial strain? In Study 2, we ask: Is volatility that feels like it can be controlled different than volatility that feels uncontrollable, in terms of financial behaviors and outcomes? Finally, in the Study 3, we develop an experimental design to be able to study a causal, rather than correlational, association between income volatility, control and financial behaviors.

This report first reviews the theoretical framework used for all three studies and then describes the methods and later the results from each three studies. We conclude with a discussion of the implications of our results with particular attention to the rise of gig work so often associated with greater income volatility.

2. Theoretical Framework

2.1   Definition of income volatility

Income volatility has, until recently, been studied mainly in terms of fluctuations in annual incomes (e.g., García-Medina and Wen, 2018; Morissette and Ostrovsky, 2005; Morissette and Ostrovsky, 2007; Beach, Finnie, & Gray, 2003 , Beach, Finnie, & Gray, 2010), sometimes examining patterns in year-over-year changes during a study period and sometimes examining changes in income at the start and end of a period of a few years. Studies have used both survey as well as administrative data (such as tax records), sometimes arriving at different conclusions. For an excellent overview of methods and the historical US literature, see Moffit and Zhang (2018).

The limited research on month-by-month income volatility has defined volatile income as even a small shift (5%) above or below usual monthly income levels (Farrell & Greig, 2015, 2016). Other work has defined income volatility more stringently, as shifts of 25% or 30% above or below average monthly income (Maag et al., 2017; TD Bank, 2017). Income volatility has also been assessed via subjective reporting, using a composite measure of income volatility, combining answers to at least three questions about the stability, consistency, and level of variability in monthly income in the last year (TD Bank, 2017) or by asking participants to report whether swings in monthly income are occasional or frequent (annual Survey of Household Economics and Decision-making (SHED), Board of Governors, 2017).

2.2   Prevalence of Income volatility

In a study analysing account transactions from JP Morgan Chase customers, over a 27-month period, Farrell and Greig (2015) showed that 84% of sampled individuals experienced swings of 5% or greater over the previous period. Follow-up studies also showed that 55% of individuals experienced swings of more than 30% in more than one month (Farrell & Greig, 2016).

Other studies suggest that half of all working age U.S. adults (aged 25 to 50 years) experience income swings of 25% or more above their average income in at least one month per year, and that for 39% (overall) the swing is negative – dropping below their average income (Maag et al., 2017). A similar study by TD Bank Group in Canada found that 12% of survey respondents reported swings of 25% or more in their income from one month to the next.

According to the annual Survey of Household Economics and Decision-making (SHED) in the U.S., 20% of respondents stated they experienced "occasional" swings in monthly income in 2015, and 22% did so in 2016 (Board of Governors, 2016; 2017). Another 12% reported "frequent" swings in income in 2015, 10% did so in 2016.

In our present research, we focus on income volatility at the monthly, rather than annual, level. We also develop a laboratory protocol that simulates frequent fluctuations in work income.

2.3   Predictors of Income volatility

Research on annual income volatility based on tax return data (García-Medina and Wen, 2018; Morissette and Ostrovsky, 2005; Morissette and Ostrovsky, 2007; Beach, Finnie, & Gray, 2003, Beach, Finnie, & Gray, 2010) suggests that:

- overall instability has risen since the late 1990s,
- men may face greater long-term instability,
- but women face greater short-term instability,
- younger workers, single mothers, and lower income households are at greater risk of annual swings in income, and,

- while public benefits (like EI and welfare) do reduce instability, Canada's overall tax and transfer system is doing less today than in previous decades to offset fluctuations in market incomes.

Research on <u>monthly</u> income volatility based on tax return data (TD Bank Group, 2017; US Financial Diaries Project: Hannagan, & Morduch, 2015; Maag et al. 2017; Morduch & Schneider, 2017) suggests that:

- self-employed, part-time, unemployed and seasonal workers were more likely to report income volatility.
- lower income households were more likely to report income volatility. However, while the volatility was most pronounced among bottom income households, even households with an income at 300% of the US poverty line reported significant volatility.
- income volatility is more prevalent among young adults and the Millennial generation.
- Americans with lower education and black or Hispanic Americans report more income volatility.

2.4   Correlates of Income volatility

Economic theory suggests that persons with volatile incomes, such as gig workers, should be motivated to save more as a way to smooth their consumption (Friedman, 1957; Modigliani, 1986; Carroll & Samwick, 1997). However, saving and other financial planning may require a safety net and financial certainties which may be unavailable to workers with volatile income.

Workers with volatile income profiles such as gig workers might face greater financial uncertainty, such as little or no access to work-related benefits like paid parental leave or retirement pensions (BLS, 2018; OECD, 2018), or barriers to accessing mainstream banking and consumer credit (Murdoch & Schneider, 2017) due to their shifting income profile. These might contribute to poorer psychological and financial outcomes for workers who experience high income volatility.

Indeed, income volatility has been linked to lower savings and poorer planning (Fisher, 2010; Barr, 2012; Mullainathan & Shafir, 2013; TD Bank Group 2017; Pew Charitable Trusts, 2017), greater financial exclusion or use of high-cost products like payday loans and other fringe financial services (Murdoch & Schneider, 2017), more missed bill payments (Farrell & Greig, 2016; 2017) and mortgage delinquency (Diaz-Serrano, 2005), lower financial knowledge scores and lower scores on a multidimensional measure of financial capability, even after controlling for a range of demographic factors (Robson & Peetz, 2018).

In summation, the increase in income profiles that are more susceptible to volatility and month-to-month shifts in income (such as gig workers, self-employed workers) may make these individuals more vulnerable to financial stress and lack of financial planning compared to individuals with salaried, stable income profiles.

2.5   Perceived control

In addition to the nature of income – stable or volatile – there is compelling evidence that psychological factors, particularly a sense of choice or personal control, play an important role in shaping financial behaviours. For example, Shephard and colleagues find that psychological variables explain a significant share of individual differences in financial capability, over and above the role of financial knowledge and attitudes (Shephard et al, 2017).

One psychological variable that might shed light on how workers perceive income volatility may be the locus of control they perceive over their actions.

2.5.1   *Locus of control*

Locus of control is the degree to which people believe that they have control over the outcome of events in their lives, as opposed to external forces beyond their

control (Rotter, 1954). More specifically, economic locus of control distinguishes whether someone believes their situation is due to internal, controllable factors such as ability and effort, or they might believe their situation is due to external, uncontrollable factors such as fate or luck (Furnham, 1986).

Respondents in a representative sample of Canadian adults who reported moderate or high levels of income volatility were more likely to believe their financial circumstances depend on external factors beyond their control (Robson & Peetz, 2018) than respondents who reported stable incomes.

But do all adults with volatile incomes experience a more externalized locus of control compared to those with reliable incomes? What if their income volatility is due to factors within their control? While some gig workers will rely on a third-party agency to arrange work opportunities, independent contractors and self-employed workers may have more control in negotiating with clients and more control over their availability to work. We note that, according to the U.S. Bureau of Labor Statistics (2018), one third of gig workers report that they prefer their current form of employment over traditional employment. Similarly, in Canada, self-employment has been rising among mothers of young children in what appears to be an effort to manage work-life strain (Statistics Canada, 2016). Clearly, some share of gig workers will have actively chosen this form of employment, for any number of reasons. We think that the effects of gig employment on financial wellbeing may depend in part on whether workers feel that swings in their income are within their own control.

In our view, self-employed workers may experience greater income volatility, relative to salaried workers, but they may also experience a greater sense of choice in when or how hard to work. We view gig workers as those workers more likely to experience volatility in their work income, but also less choice or control in when work is available to them. The self-

employed professional may be able to choose whether to take a new client, but the driver who relies on a peer-to-peer platform to book work may be more at the mercy of fluctuations in consumer demand and in activity on the platform itself. In our experimental research (Study 3), we simulate different income earning environments to test this hypothesis.

2.5.2   *Outcomes of internal sense of control*

A more internal economic locus of control has been linked to greater satisfaction with one's own financial standing in a study of 2510 U.S. households (Sumarwan & Hira, 1993), and to more purposeful shopping habits in Canadian students (Busseri, Lefcourt, & Kerton, 1998). Internal economic locus of control has also been linked to more rational financial choices (such as less discounting of future gains and losses) in a sample of British students (Plunkett & Buehner, 2007). A study of close to 10,000 Australian households showed that households where at least one person in the household had an internal locus of control saved more of their income, both in absolute terms and as percentage of earnings (Cobb-Clark, Kassenböhmer, & Sinning, 2013).

In sum, past research suggests that greater sense of control has a range of psychological and financial benefits. Similarly, a sense of control over shifts in income (i.e. endogenous volatility) might have positive outcomes whereas a sense of no control over shifts in income (i.e. exogenous volatility) might have negative outcomes.

2.6   **Overview of the present research**
2.6.1   *Aim*

The central aim of the proposed research is to understand the financial and psychological consequences of income volatility and their combined effects on financial wellbeing. How are the effects of income volatility shaped by the degree of control individuals feel over their income? We propose that the *type* of income volatility determines financial outcomes. Specifically, we propose that uncontrollable (exogenous) volatility might have

negative effects on savings behaviour, financial capability, subjective financial stress, and perceived work-life balance, whereas controllable (endogenous) volatility might be positively linked to these outcomes. We further propose that the psychological variable 'locus of control' is one key mechanism through which income volatility affects financial and psychological outcomes.

By better understanding the relationship between gig work, income volatility and financial stress and behaviors, we can better understand the challenges that are unique to gig workers and those that are shared with other working-age adults. Furthermore, by differentiating between different types of volatility – and the psychological and behavioural responses to each – we can better address the needs of the diverse population of gig workers. Finally, if we cannot reverse the tide on the growth of the gig economy and eliminate income volatility, can we design interventions to empower those with volatile incomes to gain more control over their financial lives? This will have implications for the design and delivery of financial services, but also the design and delivery of social protection through welfare systems.

2.6.2 Hypotheses

Hypothesis 1: A significant share of adults report some form of gig employment and are more likely to report financial stress, relative to workers with standard employment and better access to benefits.

Hypothesis 2: Income volatility that is exogenous, in other words due to factors outside a persons' perceived control, will be associated with more externalized and less internalized locus of control than income volatility that is endogenous, in other words due to factors within a persons' perceived control.

Hypothesis 3a: Income volatility due to exogenous factors will be negatively associated with financial and psychological outcomes compared to reliable incomes.

Hypothesis 3b: Income volatility due to endogenous factors will be positively associated with financial and psychological outcomes compared to reliable incomes.

2.6.3 Studies

We test these hypotheses in a three-step programme of research. First, we examine the rate of self-reported gig work and whether gig work has been associated with greater reported financial stress during the recession associated with COVID-19 (Hypothesis 1, tested in Study 1).

Second, we examine the effects of endogenous and exogenous income volatility compared to reliable income flows on perceived locus of control Hypothesis 2, tested in Study 2).

Third, we examine the financial and psychological outcomes of personal income volatility, distinguishing between reliable, endogenously volatile, and exogenously volatile income profiles (Hypotheses 3a and 3b, tested in Study 2 and 3). We also isolate the effects of income volatility in an experimental design that replicates the effects of different forms of gig employment (Hypotheses 3a and 3b, tested in Study 3). This experimental design allows us to establish causality in the experience of volatile simulated income on financial decisions such as saving money.

Our studies draw on the previous descriptive literature on income volatility and control for those individual characteristics that appear to be associated with stable versus volatile income profiles, such as gender, age and education. We also connect two parallel lines of past research that are relevant to understanding the effects of gig work: volatility in income and locus of control. Finally, we pursue a methodological innovation in the literature and introduce an experimental design that permits causal analysis.

3. Methodology

3.1 Study 1

3.1.1 Participants and procedure

Study 1 is a descriptive study on self-reported financial hardship during the COVID-19 crisis and explores differences in the frequency between persons with stable income and those with more participation in the gig economy. We make use of data collected at a unique time when millions of workers faced a sudden shock to their employment income. We explore whether or not pre-COVID participation in more stable or gig work is associated with measures of financial hardship during the pandemic. Data for study 1 comes from continuous online surveys conducted by Real-time Interactive Worldwide Intelligence (RIWI) and made available to us for this project. Responses to RIWI questionnaires are collected through a unique methodology called Random Domain Intercept Technology. This method ensures that anyone online on any device has an equal chance of random exposure to a RIWI survey through an inactive or abandoned internet domain. Internet users who volunteer to complete the survey do so anonymously, but can be geographically located through web data. The researchers gratefully note that RIWI made their data available to the researchers to be able to complete this study when our original data source could no longer be accessed due to COVID-related shutdowns affecting Canada's national statistical agency and its network of data centres.

The RIWI data set includes a total of 6,397 respondents in Canada (n=3,624) and the U.S. (n=2,773) to two waves of survey collection conducted throughout April 2020 (n=4,104) and June 2020 (n=2,293). Respondents' ages ranged from 25 to 54 years (M_{age} = 38.41, SD = 8.54), 48.7% female and 51.4% male. A plurality (45.3%) of respondents were married or in a common-law relationship, 29.6% were single, 10% were widowed and 15.1% were

separated or divorced. A majority (52.8%) of respondents had a post-secondary diploma or degree, while minorities had not completed secondary (14.2%), secondary only (20.7%) or an advanced post-secondary degree (12.4%).

3.1.2 Measures

We analysed the RIWI data for April using self-reported access to paid sick leave as a proxy variable for work that is more stable and income profiles that are more reliable, in contrast to gig workers. Previous studies of the characteristics of different forms of work in Canada suggest that paid sick leave is strongly associated with work that follows a standard and predictable schedule and greater job security (Chen and Mehdi, 2018).

Analysis of the June data from RIWI used several direct questions about participation in gig employment. Respondents were asked about their main way of earning money in the previous month, including working for an employer, owning a business, or three forms of activity that likely rely on digital platforms: transporting people or food, renting out property, or selling goods or services online. Participants were also asked about the approximate proportion of their income currently came from those same activities. We consider both whether a respondent had any income from gig-like activities, and also the intensity of their reliance on gig-like activities for income.

Respondents were asked about financial stress in two ways. In both cycles of the survey, respondents were asked about the main source of stress or anxiety they believe their family or close friends were currently facing, including "losing a job / paying bills" and also "difficulty getting enough food". In the April cycle only, respondents were also asked how long

they would be able to pay their bills if they lost their current source of income.

3.2   Study 2

3.2.1   Participants and procedure

In Study 2, we collect original survey data on the incidence and correlates of income volatility, including the association between volatility and locus of control. We recruited 1,005 U.S. American participants. Of these, 23 participants were excluded from analysis for failing an attention check, resulting in a final N of 982. Participants' ages ranged from 18 to 76 years (M_{age} = 37.03, SD = 11.45), 46.3% female, 53.2% male, and 0.5 other participants, 54.3% were single or separated/ divorced/ widowed, 45.7% were married or living common law. Education level ranged from high school or less (11.2%), over some college/university without a degree (23.5%) to college/trade degrees (19.7%), undergraduate degrees (32.1%) and graduate degrees (13.6%). Personal annual income ranged from under 20,000 (23.4%) to over 100,000 USD (8.4%), average income was 40,000-50,000 USD.

Participants were recruited through the recruitment platform Mechanical Turk. They completed the survey online and were compensated with a nominal amount of money. Data was collected in July 2019.

3.2.2 Measures

First, participants reported demographic information. They reported their age, gender, marital status (single/divorced/widowed vs. common-law/married), education in 5 categories (high school or less; some college/university without a degree; college/trade degrees; undergraduate university degree graduate university degree) and personal annual income before taxes in 11 categories (from *under $20,000* to *$150,000 or more*).

Next, participants reported on the nature of this income. Participants rated the amount of volatility ("How much does the amount of money you make change from month to month?") on a scale from 1

(*Amount of income is the same every month*) to 7 (*Amount of income changes a lot from month to month*) and the amount of control ("To what degree do you feel you can control how much money you make in a month?") on a scale from 1 (*I have no control at all*) to 5 (*I have all the control*).

Most pertinently, they were asked "Overall, which of these three income types describes your personal situation best?" and selected one of three options: "My income is stable" (salaried work), "My income varies and I have no control over how it varies (for example, I rely on a placement agency to arrange work or rely on a case worker to determine benefit levels)" (*gig work*), or "My income varies and I have control over how it varies (for example, I can decide how much to make)" (*self-employment*).

Participants completed a locus of control scale (Rotter, 1966, e.g. "What happens to me is my own doing."). The scale was aggregated into an internal locus of control scale (Cronbach's alpha = .65). They also completed an economic locus of control scale (Furnham, 1986, e.g., "When I get what I want, it is usually because I worked hard for it."; "There is little one can do to prevent poverty."(reverse coded)). The scale was aggregated into an internal locus of control scale (Cronbach's alpha = .67). Both scales were answered from *Strongly Disagree* (1) to *Strongly Agree* (7).

To assess psychological outcomes, participants completed a 5-item life satisfaction scale (Diener, Emmons, Larsen, & Griffin, 1985, e.g. "I am satisfied with my life.") on scales from 1 (Strongly disagree) to 7 (Strongly agree). The items were aggregated (α = .93). They completed two items assessing work-life interference (Dupre, 2018; e.g. "How often did your job or career interfere with your responsibility at home, such as yard work, cooking, cleaning, repairs, shopping, paying the bills, or child care in the last week?") on scales from never (1) to very often (5). The items were averaged.

To assess financial well-being, participants completed a single item measure of financial stress (Frone, Russell, & Cooper, 1992; "Right now, how stressed do you feel about your financial situation?") on scales from 1 (Not at all stressed) to 5 (Extremely stressed).

Participants also completed a number of questions about financial capability (Robson & Splinter, 2015). Financial capability is measured as a latent construct with five underlying domains, assessed both in terms of self-reported behaviours as well as confidence about one's own abilities:

- Making ends meet: capability in using financial resources to cover ongoing expenses.
- Keeping track: capability in budgeting and monitoring personal finances.
- Planning ahead: capability in making financial plans for known life events (retirement) and unexpected future expenses.
- Choosing products: capability in exercising choice in financial products and services.
- Staying informed: capability in ongoing learning about personal finances.

This approach has previously been used in studies in the United Kingdom, Ireland, Norway, Italy, and Canada (Bongini, Iannello, Rinaldi, Zenga, & Antonietti, 2018; Kempson, Collard & Moore, 2005; Atkinson et al, 2006; Statistics Canada 2008; 2014; McKay, 2011; Russian Trust Fund, 2013). Results are calculated as scores on five scales using responses from 16 question items.

Participants also completed a scale of risk aversion in investing, discounting preferences, and financial self-control strategies, but these scales are not analysed further here. For the full, unabbreviated materials, please see Appendix A.

3.3 Study 3

3.3.1 Participants and procedure

In Study 3, we used an experimental design to test for a causal relationship between income volatility-mediated by control over the volatility-and financial outcomes. We recruited 152 Canadian community participants in Ottawa, Canada. Of these, 2 participants did not finish the study and 1 participant was unable to read or understand the questions. These participants were excluded from analysis, resulting in a final N of 149.

Participants' ages ranged from 18 to 76 (M age = 33.85, SD = 14.06), 59.7% female, 38.9% male, and 1.3% other participants, 75.9% were single or separated/divorced or widowed, 24.2% were married or living common law. Education levels ranged from high school or less (14.1%), over some college/university without a degree (17.4%) to college/trade degrees (14.1%), undergraduate degrees (28.2%) and graduate degrees (26.2%). Personal annual income ranged from under 20,000 (41.9%) to over 100,000 USD (4.4%), average income was 30,000-40,000 USD.

Participants were recruited through posters and flyers in the local community. They signed up via a website or by emailing the researchers. The study was conducted in local public spaces. Participants completed the study one-on-one with a research assistant. They answered all questions and completed the simulated work on mobile devices provided by the research assistant. They were compensated with $15 for their time and received additional "income" from the simulated work. Data was collected from August 2019 to February 2020. For the full, unabbreviated materials, please see Appendix B.

3.3.2 Measures

First, participants reported demographic information. They reported their age, gender, marital status (single/divorced/widowed vs. common-law/married), education in 5 categories (high school or less; some

college/university without a degree; college/trade degrees; undergraduate university degree graduate university degree) and personal annual income before taxes in 11 categories (from *under $20,000* to *$150,000 or more*).

Next, participants reported on the nature of this income. Participants rated the amount of volatility ("How much does the amount of money you make change from month to month?") on a scale from 1 (*Amount of income is the same every month*) to 7 (*Amount of income changes a lot from month to month*) and the amount of control ("To what degree do you feel you can control how much money you make in a month?") on a scale from 1 (*I have no control at all*) to 5 (*I have all the control*).

Most pertinently, they were asked, "Overall, which of these three income types describes your personal situation best?" and selected one of three options: "My income is stable" (salaried work), "My income varies and I have no control over how it varies (for example, I rely on a placement agency to arrange work or rely on a case worker to determine benefit levels)" (*gig work*), or "My income varies and I have control over how it varies (for example, I can decide how much to make)" (*self-employment*).

Participants again completed a locus of control scale (Rotter, 1966), an economic locus of control scale (Furnham, 1986), a life satisfaction scale (Diener, Emmons, Larsen, & Griffin, 1985, e.g. "I am satisfied with my life."), two items on work-life interference (Dupere, 2018), a single item measure of financial stress (Frone, Russell, & Cooper, 1992), and a measure of financial capability (Robson & Splinter, 2015).

Then, participants took part in an experiment that simulated different types of work. For about 30 minutes, participants completed a variety of tasks (e.g. mental and visual puzzles) for which they received 'points' as payment. They were informed that the points would later be exchanged for real

money (without specifying the conversion metrics), so their earnings from the simulated task would actually be paid out to them. In the gig condition (n = 50), tasks paid out different amounts of points and participants received very different payout across three 'work periods' (i.e. high volatility) and tasks were assigned to participants without their input (i.e. low control). In the self-employment condition (n = 50), tasks paid out different amounts of points and participants received very different payout across three 'work periods' (i.e. high volatility) and participants could chose the tasks they wanted to complete based on the nature of the task and based on the points these tasks would earn (i.e. high control). In the salaried work condition (n = 49), participants received the same payout across three 'work periods', and in each period, participants were given all tasks and told to work through them at their own pace. This manipulation was pilot tested in a separate sample of 30 university students, to ensure that the simulated work was indeed perceived as either volatile and controllable as intended.

We assessed a number of judgments about the simulated work. As manipulation check, participants reported perceived volatility of the simulated income on two items ("How much did the payout (i.e. points/"income") change between tasks?", "How stable were the points you earned (i.e. the "income") from task to task? (reversed)", r = .34) on 5-point scales, and reported perceived control over the simulated work on three items (e.g. "How much control did you feel you had over the number of points earned", α= .66) on 5-point scales. Participants also reported enjoyment ("How much did you enjoy the income game?") and stress ("How stressed did you feel during the income game?") on single items on scales from 1 (Not at all) to 5 (Very much) and completed the Positive Affect Negative Affect Scale (Watson, Clark, & Tellegen, 1988) which was aggregated to measure general positive affect (α= .91) and general negative affect (α= .89), respectively.

After finishing the simulated work, participants were paid for their work. Everyone received $15. After being informed of their payment, participants were given a choice: They could choose to take the $15 now, or to "save" their earnings by waiting two weeks and receiving $17 ($15 earnings plus $2 in "interest"). In each case participants were paid the amount in gift cards to either Amazon or Walmart and the gift card was ordered immediately, with the participant entering their own email address and the research assistant inputting the amount and the date on which the gift card should be sent. This was done to avoid conflating trust in the research assistant (e.g. thinking he/she might not remember to send it later) and delay. Similarly, we chose online gift cards rather than cash to avoid conflating effort (e.g. having to come back in person to collect cash) and delay.

4. Results

4.1 Study 1

### 4.1.1 *Gig work and financial strain during COVID*

Study 1 makes use of a unique and global event – a sudden and widespread economic and health shock that has interrupted the ability of millions of workers to earn their work incomes. The literature on income volatility, reviewed earlier, suggests that workers in more precarious forms of work will have less financial resilience when a shock to earnings take place. Our results, below, are consistent with this observation.

In April, 35.3% of Canadian respondents and 34.2% of American respondents reported that they would be able to take a paid sick leave from employment if they became ill. Again, we treat this as a proxy measure for employment that is least likely to be gig-work. Workers in employment that is more secure and predictable will be more likely to have access to a paid sick leave, particularly in Canada where unemployment insurance, including benefits for short-term sickness, covers many workers in standard, stable employment. We find (at Figure 1, side) that respondents who are least likely to be in gig work (again, estimated in terms of access to paid sick leave) reported less financial anxiety, both in terms of paying bills (chi^2 = 8.133, p<0.05, and also less anxiety about access to adequate food (chi^2 = 7.349, p< 0.05). However, we note that the overall incidence of food insecurity was very low. We also find that likely distance from gig-work was also associated with a small but significant (at p< 0.05) difference in the precarity of their financial situation. Relative to other workers, those who were least likely to be gig workers expressed greater confidence in their ability to meet their ongoing expenses and for a longer period of time if their income were to stop.

We also tested the association between likely distance from gig-work and financial precarity, measured as the length of time a respondent

expected to be able to pay their on-going expenses even if their income stopped. In this circumstance, people may use other financial resources to cover on-going expenses including drawing down savings, selling assets, accessing formal credit or informal borrowing (Robson & Splinter, 2015). In a simple, linear regression analysis, controlling for age, education and gender, we find having access to paid sick leave (i.e. an indicator that the person was less likely to be employed as gig worker) to be positively associated with being able to make ends meet for a longer period of time, even if regular income were to be stopped (Beta = 0.11, p<0.01, see Figure 1). Again, participants were asked how long they would be able to meet their ongoing financial obligations.

Figure 1

Differences in financial precarity during COVID
(RIWI data, April 2020, Canada and the U.S.)
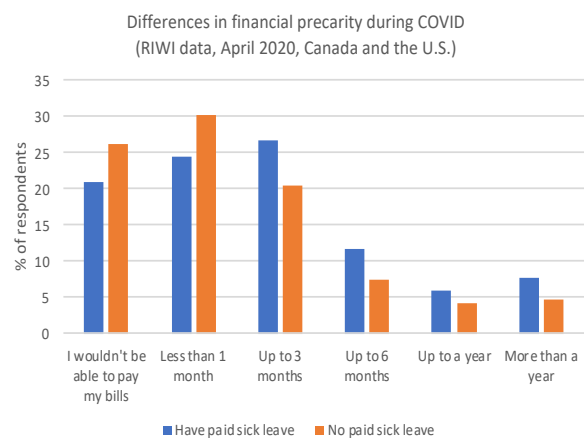
Data from the June cycle of RIWI's survey allows us to more directly identify gig workers. The data suggest that a larger share of workers have some participation in gig-work than the share for whom it represents their main source of income. Overall, 39% of respondents reported one or more forms of gig income in June. The percentage was the same in both Canada and the United States. However, when asked about their main source of income in the last month, smaller shares reported relying on transporting people or delivering food (6.4% in

Canada, 4% in the U.S.), selling goods or services online (7.1% in Canada, 6% in the U.S.) or renting out a property (8% in Canada, 3.6% in the U.S.).

Among those engaged in any form of gig work, the income from gig work most frequently accounted for one quarter for their total income (mode 26.3% for online services, 29% for online goods, 30.5% for transporting people or delivering food). Finally, we find that there is a small share of workers who are earning income from more than one form of gig work. Overall, 8.5% were engaged in just one form of gig work (8.9% in Canada, 7.7% in the U.S.) but 20.8% were engaged in all three forms of gig work measured (20.2% in Canada, 22% in the U.S.).

Participation in any gig work, or in several forms of gig work, was not associated with higher rates of anxiety about job loss or paying bills, according to the June RIWI data. In fact, workers without gig employment were slightly more likely to report this type of financial concern, though the difference is not statistically significant.

Figure 2

Differences in self-reported food anxiety during COVID (RIWI data, June 2020, Canada and the U.S.)
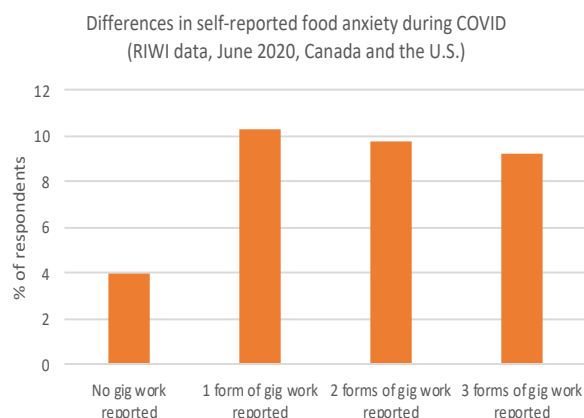
As reported in Figure 2, gig work was, however, associated with significantly greater anxiety about having adequate food ($chi^2 = 29.79$ p<0.01). Just 4% of workers without any gig work reported anxiety about food, versus 10.3% of workers participating in 1 form of gig work, 9.8% of workers participating in 2 forms and 9.2% of workers participating in all three

forms of gig work. This result suggests that income volatility can have implications for individuals' fundamental need fulfillment, doubling the percentage of those who are worried about access to adequate food.

4.2   Study 2

4.2.1   Prevalence of income volatility

Participants self-classified their own employment as income that varies uncontrollably (n = 152, 15%), as income that varies but variations are controllable (n = 363, 36%), or income that is stable (n = 467, 48%). Thus, almost half of our participants stated that their income changes month-to-month. Furthermore, 13.4% of participants selected "amount of income changes a lot from month to month" (7 on the 7-point scale) on the single item measuring extent of volatility, and only 8.4% selected "Amount of income is the same every month" (1 on the 7-point scale).

Means and test statistics for one-way Analysis of Variance (ANOVA) comparing the three different income profile groups are presented in Table 1.

In line with their categorical self-classification, we found that participants who were gig workers also reported low control over income amounts and high volatility of income, participants who were self-employed reported high control and high volatility, whereas those who self-classified as salaried workers reported low volatility. This result validates participants' self-classification in the three income profile groups with a different self-report measure.

4.2.2   Locus of Control

Participants who self-classified their income as varying uncontrollably reported significantly lower internal locus of control and a lower economic locus of control than salaried workers (see Table 1). However, self-employed workers who reported having control over the swings in income reported a sense of internal control in general and a sense of control over their finances that was equal to salaried workers.

Table 1.

Observed (unadjusted) means by self-classified income profile

	"My income varies and I have no control over how it varies"	"My income varies and I have control over how it varies"	"My income is stable"	*ANOVA*
volatility of income	5.39$_c$ (1.45)	4.53$_b$ (1.63)	2.86$_a$ (1.62)	F =491.19, p <0.001
controllability of income swings	3.27$_b$ (0.64)	3.40$_c$ (0.65)	2.95$_a$ (0.77)	F = 79.12, p <0.001
Locus of Control	3.78$_a$ (0.61)	4.08$_b$ (0.61)	4.15$_b$ (0.58)	F =22.39, p <0.001
Economic Locus of Control	4.29$_a$ (0.99)	4.89$_b$ (0.97)	4.93$_b$ (0.99)	F =26.14, p <0.001
life satisfaction	3.79$_a$ (1.77)	4.27$_b$ (1.66)	4.75$_c$ (1.47)	F =23.74, p <0.001
work-life interference	3.01$_a$ (1.02)	2.59$_b$ (1.03)	2.46$_b$ (1.03)	F =16.39, p <0.001
Financial well-being:				
self-reported financial stress	3.59$_a$ (1.04)	2.79$_b$ (1.12)	2.45$_c$ (1.12)	F =60.45, p <0.001
Making ends meet	223.16$_a$ (61.42)	244.15$_b$ (44.38)	244.12$_b$ (41.27)	F =12.95, p <0.001
Keeping track of money	49.44$_a$ (11.03)	50.00$_a$ (9.10)	49.66$_a$ (8.71)	F =0.24, p = .788
Choosing products	7.10$_a$ (1.01)	7.41$_b$ (0.93)	7.54$_b$ (0.91)	F =11.00, p <0.001
Staying informed	4.29$_a$ (1.21)	4.70$_b$ (1.36)	4.89$_c$ (1.22)	F =11.01, p <0.001
Planning ahead	7.96$_a$ (8.72)	6.66$_b$ (6.46)	6.51$_b$ (5.29)	F =3.04, p = .048

Note. Different subscripts indicate means that differ significantly at α = 0.05.

4.2.3 Psychological Outcomes

Participants who self-classified their income as varying uncontrollably reported significantly lower life satisfaction than participants who self-classified their income as stable or participants who reported varying income but reported control over these variations (see Table 1). Participants who reported controllable volatility in their income reported less life satisfaction than participants who reported stable incomes. Participants who self-classified their income as varying uncontrollably also reported more work-life interference than the other two groups. In summation, a volatile income profile was detrimental to psychological outcomes, although having control over the volatility in income buffered these effects to some degree.

4.2.4 Financial Well-being

Participants who self-classified their income as varying uncontrollably and those who reported a degree of control over these variations reported significantly more financial stress than participants who reported stable incomes (see Table 1).
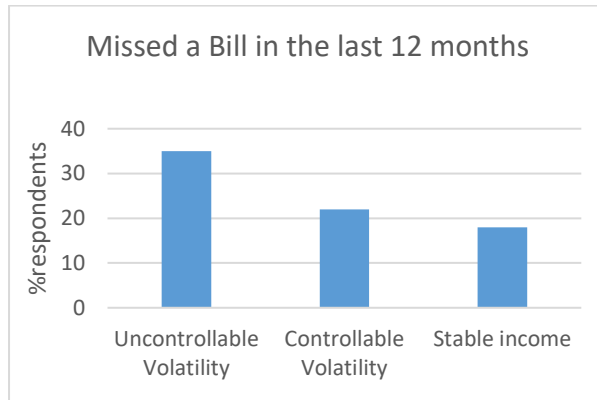
Participants who self-classified their income as varying uncontrollably also scored lower on three out of five areas of financial capability, especially in the "making ends meet" category. For instance, one of the questions in this section assesses whether they have missed paying a bill in the last 12 months. Thirty-five percent of participants who self-classified as having uncontrollable volatile income (vs 22% of participants with controllable volatile income and 18% of participants with stable income) reported that they had missed a bill payment. This is depicted in Figure 3. Again, participants who reported volatile income they could control scored more-similarly to participants with stable incomes than participants with volatile incomes they could not control on these indicators of financial capability.

4.2.5 Robustness

In additional Analyses of Covariance (ANCOVAs), we controlled for demographic variables (age, gender, marital status, education, income category). All income volatility group differences on financial well-being measures held when holding these

variables constant (with the exception of 'Planning ahead', which was no longer significantly different between groups). These analyses are presented in Appendix 7.3.

Figure 3

Missed a Bill in the last 12 months

4.3   Study 3

4.3.1   Prevalence of income volatility

Participants self-classified their own employment as income that varies uncontrollably (n = 23, 15%), as income that varies but variations are controllable (n = 32, 22%), or income that is stable (n = 94, 63%). Thus, about one-third of our participants stated that their income changes month-to-month. However, only 8.1% of participants selected "amount of income changes a lot from month to month" (7 on the 7-point scale) on the single item measuring extent of volatility, whereas 43.4% selected "Amount of income is the same every month" (1 on the 7-point scale), a marked difference from Study 2. This suggests that overall, this sample experienced less income volatility than the sample in Study 2. Even though the proportional share of participants who self-classified their income as volatile was similar, the amount of volatility they experienced month-to-month was likely much lower.

Means and test statistics for one-way Analysis of Variance comparing the three different income profile groups are presented in Table 2. In line with their categorical self-classification, we found that

participants who self-classified as workers with uncontrollable volatile income also reported low control over income amounts and high volatility of income, participants who self-classified in the group specifying controllable volatile income reported high control and high volatility, whereas those who self-classified as workers with stable income reported low volatility. These results validate the self-classification with a separate self-report measure.

4.3.2   Locus of control

There were no significant differences between income profile groups regarding locus of control or economic locus of control.

4.3.3   Psychological Outcomes and Financial Well-being

Participants who self-classified as workers with uncontrollable volatile income reported significantly lower life satisfaction and more work-life interference than participants who self-classified as stable income workers (see Table 2). Participants who self-classified as having controllable volatile income profiles reported similar life satisfaction and work-life interference as those reporting stable incomes. In sum, a volatile income profile was detrimental to psychological outcomes, although having control over the volatility in income buffered these effects.

Participants who self-classified as workers with uncontrollable volatile income reported significantly more financial stress than salaried workers (see Table 2). Participants who reported a degree of control over the shifts in their income did not differ from either those in the uncontrollable volatile income group or those in the stable income group. Participants who self-classified as workers with uncontrollable volatile income only scored lower on one out of five areas of financial capability, in the "planning ahead" category, but there were no group differences in any of the other income profile groups.

Table 2
Observed (unadjusted) means by self-classified income profile

	"My income varies and I have no control over how it varies"	"My income varies and I have control over how it varies"	"My income is stable"	*ANOVA*
volatility of income	3.77$_a$ (2.31)	4.38$_a$ (2.11)	1.67$_b$ (1.07)	F = 43.20, p<.001
controllability of income swings	2.30$_a$ (0.82)	3.03$_b$ (0.78)	2.58$_a$ (1.11)	F = 3.87, p<.001
Locus of Control	3.96$_a$ (0.53)	4.02$_a$ (0.53)	4.05$_a$ (0.50)	F = 0.24, p =.787
Economic Locus of Control	4.99$_a$ (0.83)	5.23$_a$ (1.00)	5.10$_a$ (0.93)	F = 0.45, p =.637
life satisfaction	3.44$_a$ (1.07)	4.89$_b$ (1.21)	4.49$_b$ (1.36)	F = 8.92, p <.001
work-life interference	2.91$_a$ (1.04)	2.56$_{a,b}$ (1.12)	2.37$_b$ (1.02)	F = 2.44, p =.091
Financial well-being:				
self-reported financial stress	3.30$_a$ (1.15)	2.97$_{a,b}$ (1.15)	2.48$_b$ (1.10)	F = 6.09, p =.003
Making ends meet	6.53$_a$ (1.19)	6.86$_a$ (0.72)	6.87$_a$ (1.14)	F = 1.00, p = .370
Keeping track of money	42.76$_a$ (8.30)	46.02$_a$ (4.30)	43.76$_a$ (8.30)	F = 1.47, p = .233
Choosing products	6.78$_a$ (1.34)	6.70$_a$ (1.33)	6.98$_a$ (1.46)	F = 0.57, p = .570
Staying informed	5.23$_a$ (1.63)	5.13$_a$ (1.29)	5.19$_a$ (1.56)	F = 0.03, p = .971
Planning ahead	4.83$_a$ (1.12)	4.64$_a$ (1.29)	5.12$_b$ (1.16)	F = 2.11, p = .125

Note. Different subscripts indicate means that differ significantly at α = 0.05.

4.3.4 Experimental Manipulation Effect

A manipulation check confirmed that the simulated work in the gig work condition was perceived as low in control and high in payout volatility, the simulated work in the self-employed work condition as perceived as high in control and high in payout volatility, and the simulated work in the stable salary-style condition was perceived as low in volatility and control. Means by condition are presented in Table 3.

There were no differences between experimental conditions in terms of enjoyment, $F(2,144) = 0.57$, p = .568, or stress, $F(2,144) = 0.71$, p = .493, during the simulated work and no difference in general positive affect, $F(2,144) = 0.15$, p = 858, or negative affect, $F(2,144) = 0.44$, p = .644, after the work, indicating that the simulated work differed only in the two relevant aspects, volatility and control. Means by condition are presented in Table 3.

Next, we examined participants' choice of payout after the simulated work. Participants in the stable salary-style condition were more likely to choose the delayed payout (84%) than participants in the gig work condition (68%) or self-employment condition (68%). The difference between the two volatile groups and the stable group was significant, X^2 ($df = 1$, $N = 149$) = 4.11, $p = .043$. The number of participants who chose delayed payout was identical in the two volatile conditions, X^2 ($df = 1$, $N = 100$) = 0, $p = 1$. We also examined the difference in choice between conditions while controlling for demographic variables (age, gender, marital status, education, income amount). When accounting for these covariates, the condition variable (stable salary-style condition = 0, gig or self-employment condition = 1) still affected the choice to delay payout significantly, $B = -0.94$, $SE = 0.48$, $Exp(B) = 0.39$, $p = .049$, $R^2 = 24\%$ (see Table 4).

In sum, participants who had received volatile rewards for simulated work lasting only about 30 minutes (akin to gig work or self-employment) were more likely to choose immediate payout of their "earnings" rather than waiting a longer time for a higher payout compared to participants who had received stable, salary-style rewards for the simulated work.

Table 3
Observed (unadjusted) means by condition

	"Gig" condition	"Self-Employment" condition	"Salary" condition	*ANOVA*
Controllability of simulated work	2.61_a (0.92)	3.22_b (0.99)	$2.88_{a,b}$ (0.96)	$F = 4.99$, $p = 008$
Volatility of simulated income	3.46_a (0.74)	3.44_a (0.64)	2.79_b (0.92)	$F = 11.49$, $p = .001$
Enjoyment of simulated work	3.82_a (1.06)	3.65_a (1.14)	3.86_a (0.91)	$F = 0.57$, $p = .568$
Stress during simulated work	2.98_a (1.29)	2.77_a (1.31)	2.67_a (1.33)	$F = 0.71$, $p = .493$
General Positive Affect	2.89_a (0.92)	2.85_a (0.80)	2.80_a (0.77)	$F = 0.15$, $p = .858$
General Negative Affect	1.44_a (0.48)	1.54_a (0.73)	1.43_a (0.59)	$F = 0.44$, $p = .644$

Note. Different subscripts indicate means that differ significantly at α = 0.05.

Table 4
Logistic regressions predicting choice of delayed payout ($17) rather than immediate payout ($15)

	B	*SE*	*B(Exp)*	*p*
Model 1 (R^2 = 24%)				
Age	-.01	.53	1.00	.760
Sex (indicator variable: female)	-.51	.43	.60	.239
Marital status (indicator variable: married)	-.61	.54	.54	.256
Education (5 levels)	.80	.20	2.23	<.001
Income amount (11 levels)	-.14	.11	.87	.198
"Gig work" (1) vs. other conditions (0)	**-.94**	**.53**	**.39**	**.077**
"Self-employment" (1) vs. other conditions (0)	**-.93**	**.53**	**.39**	**.081**
Model 2 (R^2 = 24%)				
Age	-.01	.02	1.00	.760
Sex (indicator variable: female)	-.51	.43	.60	.237
Marital status (indicator variable: married)	-.61	.53	.55	.253
Education (5 levels)	.80	.20	2.23	<.001
Income amount (11 levels)	-.14	.11	.87	.193
Volatile conditions (1) vs. Stable condition (0)	**-0.94**	**0.48**	**0.39**	**.049**

5. Conclusion and Discussion

5.1 Conclusion

Our three studies confirm that income volatility is experienced by a significant share of working-age adults. We find that the COVID crisis appears to have had a particularly pronounced impact on the financial resilience of workers in more precarious forms of employment. This crisis has created an unprecedented shock to the employment incomes of millions of workers and pre-COVID income profiles that are less stable appear to be associated with greater hardship in the summer of 2020. This is consistent with previous research, but documents the association in a particular and globally significant context.

We also find that workers with less predictable income profiles experience a weaker internal locus of control. This builds on previous literature by linking together two separate strands of research on each income volatility and locus of control. This finding also confirmed our primary motivation for this project that locus of control may be an important mediator to the effects of income volatility on financial well-being. Gig workers with limited control over what income they can earn may have different experiences when it comes to financial choices, compared to self-employed workers with greater choice and agency over when to work and how much to earn.

Finally, in an experimental setting, we find that income volatility is associated with lower willingness to save, which we interpret as a less positive financial behaviour. This study does not, however, confirm our hypothesis that locus of control should mediate the effects of income volatility on financial behaviours. In the lab, participants in the volatile employment simulations, with or without choice over when and how much to work, were less likely to be willing to save their earnings. Instead, income volatility, on its own, appears to drive the observed impacts on decision-making.

5.2 Implications

Consider two people: Jane works as often as possible doing freelance writing on a few different platforms. Her income goes up and down a lot from one month to the next and it's hard for her to predict what kinds of projects might be available or what projects she'll win. Meanwhile, John works as a salaried writer at a large newspaper. He makes as much money as Jane but his income is the same each month. Who saves more?

In theory, to smooth her consumption, Jane should be saving in good months to off-set months where she doesn't win as much freelance work on the gig platforms. But, according to our findings, Jane will save less than John, simply because of the nature of her income. Swings in her income will mean that Jane think more about the short-term than John. She prefers to use her money now instead of waiting and saving to have more money later on. If a sudden emergency were to happen, Jane could be at risk in two ways: 1) if she doesn't qualify for government programs that are often meant for people in traditional employment and 2) if she doesn't have much if anything of her own saved up because she is used to living paycheque to paycheque.

So far, our research suggests that financial decisions might be a result not only of the amount of income someone makes, but also of the predictability or volatility of that income. For stakeholders, these findings raise important questions: For practitioners in financial services, the question is: are their products and services (things like automated savings or investment plans) set up to work for clients whose

incomes rise and fall unpredictably? Are automated and constant contributions to savings plans something that might deter participation by consumers who feel their income is unpredictable and who may be more focused on the short-term? Could short-term and liquid savings be an important source of financial well-being, in addition to long-term savings for retirement? Can products and services be adapted or created to better support the financial well-being of clients who can't count on the same paycheque each month? Importantly, given that our results show that a significant proportion of workers have some gig income, even if it isn't their main source of income, how should lenders treat this income in assessing credit-worthiness? On the one hand, it is income that is unpredictable and may not always be available to meet ongoing expenses including bill and loan payments. On the other hand, access to short-term and affordable credit may be an important way for workers with volatile incomes to make ends meet when they have a bad month.

For policy-makers in government, the key question is whether income assistance and social assurance programs should continue to be tied to jobs or whether they should be adapted to include income earned by gig work. Several countries have only partially included self-employed and gig workers in their social safety nets. But during the COVID crisis, several governments moved quickly to expand coverage or, as in Canada, to create new benefits that explicitly included gig workers. Is this the right direction looking ahead? The global economy has suffered the most acute shock on record. As economies navigate a pathway to partial and eventual recovery in the wake of the virus, we may find that more work has been converted to on-demand forms of labour where a worker can't be certain of their take-home pay from one period to the next. We may see more employers shift to contracts with workers who are paid as self-employed, rather than employees.

By covering non-standard and precarious work in social insurance systems, it is possible that governments will have created a form of moral hazard, making it easier for firms to expand gig work and potentially increasing the share of the work force with volatile incomes. This risk might be mitigated if social protections for workers include working conditions (such as minimum paid hours) as well as income insurance. Furthermore, government income programs should be designed and delivered in a way that reduces overall income volatility for households, helping them to smooth within-year shocks to work income. The monthly income volatility and participation in some form of gig work is, as our work in this report illustrates, too widespread to ignore.

6. References

Atkinson, A. B., & Brandolini, A. (2006). The panel-of-countries approach to explaining income inequality: an interdisciplinary research agenda. *Mobility and Inequality: Frontiers of Research in Sociology and Economics*, 400-448.

Barr, M. S. (2012). *No Slack*. Washington D.C.: The Brookings Institute.

Beach, C. M., Finnie, R., & Gray, D. (2003). Earnings Variability and Earnings Instability of Women and Men in Canada: How Do the 1990s Compare to the 1980s? *Canadian Public Policy / Analyse de Politiques*, *29*, S41–S63. https://doi.org/10.2307/3552276

Beach, C. M., Finnie, R., & Gray, D. (2005). The Impact of Macroeconomic Conditions on the Instability and Long-Run Inequality of Workers' Earnings in Canada. *Relations Industrielles; Quebec*, *60*(2), 244–272.

Beach, C. M., Finnie, R., & Gray, D. (2010). Long-Run Inequality and Short-Run Instability of Men's and Women's Earnings in Canada. *Review of Income and Wealth*, *56*(3), 572–596. https://doi.org/10.1111/j.1475-4991.2010.00406.

Bongini, P., Iannello, P., Rinaldi, E. E., Zenga, M., & Antonietti, A. (2018). The challenge of assessing financial literacy: alternative data analysis methods within the Italian context. *Empirical Research in Vocational Education and Training*, *10*(1), 12.

Bureau of Labor Statistics (2018). "Contingent and Alternative Employment Arrangements Summary", United States Department of Labor, June 2018. Retrieved from https://www.bls.gov/news.release/conemp.nr0.htm

Busseri, M. A., Lefcourt, H. M., & Kerton, R. R. (1998). Locus of control for consumer outcomes: Predicting consumer behavior. *Journal of Applied Social Psychology*, *28*(12), 1067-1087.

Carroll, C. D., & Samwick, A. A. (1997). The nature of precautionary wealth. *Journal of Monetary Economics, 40*(1), 41-71.

Chen, W-H., & Mehdi, T. (2018). Assessing job quality in Canada: A multidimensional approach. Analytical Studies Branch Research Paper Series, Statistics Canada: Ottawa.

Cobb-Clark, D. A., Kassenboehmer, S. C., & Sinning, M. G. (2016). Locus of control and savings. *Journal of Banking and Finance*, *73*, 113-130.

Diaz-Serrano, L. (2005). Income volatility and residential mortgage delinquency across the EU. *Journal of Housing Economics*, *14*(3), 153-177. (it's volatility not income that matters most to predict defaulting)

Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of personality assessment*, *49*(1), 71-75.

Dupre, K. (2018). Personal communication.

Farrell, D., & Greig, F. (2015). Weathering Volatility: Big data on the Financial Ups and Downs of U.S. Individuals. JP Morgan Chase Institute. Washington.

Farrell, D., & Greig, F. (2016). Paychecks, paydays, and the online platform economy: Big data on income volatility. JP Morgan Chase Institute. Washington.

Fisher, P. J. (2010). Income uncertainty and household saving in the United States. *Family and Consumer Sciences Research Journal*, *39*(1), 57-74.

Friedman, M. (1957). The permanent income hypothesis. In *A theory of the consumption function* (pp. 20–37). National Bureau of Economic Research. Retrieved from http://ideas.repec.org/b/nbr/nberbk/frie57-1.html

Frone, M. R., Russell, M., & Cooper, M. L. (1992). Antecedents and outcomes of work-family conflict: testing a model of the work-family interface. *Journal of Applied Psychology, 77*(1), 65.

Furnham, A. (1986). Economic locus of control. *Human Relations*, *39*(1), 29-43.

García-Medina, & Wen, (2014). Income Instability and Fiscal Progression. Working paper. Canadian Research Data Centre Network.

Hannagan, A., & Morduch, J. (2015). Income gains and month-to-month income volatility: Household evidence from the US Financial Diaries.

Jeon, S-H., Liu, H., & Ostrovsky, Y. (2019). Measuring the gig economy in Canada using administrative data. Analytical Studies Branch Research Paper Series, Statistics Canada: Ottawa.

Kempson, E., Collard, S., & Moore, N. (2005). *Measuring financial capability: an exploratory study | School of Geographical Sciences | University of Bristol* (No. Consumer Research 37). London, United Kingdom: Financial Services Authority. Retrieved from http://www.bristol.ac.uk/geography/research/pfrc/themes/fincap/measuring-fincap.html

Maag, E., Peters, H.E., Hannagan, A., Lou, C., & Siwicki, J. (2017). Income Volatility: New Research Results with Implications for Income Tax Filing and Liabilities. Tax Policy Centre. The Urban Institute and Brookings Institution. Washington.

McKay, S. (2011). *Understanding Financial Capability in Canada: Analysis of the Canadian Financial Capability Survey*. Task Force on Financial Literacy.

Modigliani, F. (1986). Life cycle, individual thrift, and the wealth of nations. *The American Economic Review*, 297–313.

Moffit & Zhang (2018). Income Volatility and the PSID: Past research and new results. Working paper 24390. National Bureau of Economic Research.

Murdoch, J., & Schneider, R. (2017). *The Financial Diaries: How American Families Cope in a World of Uncertainty*. Princeton, NJ: Princeton University Press.

Morissette, R., & Ostrovsky, Y. (2005). The instability of family earnings and family income in Canada, 1986-1991 and 1996-2001. *Canadian Public Policy/Analyse de politiques*, 273-302.

Morissette, R., & Ostrovsky, Y. (2007). *Income instability of lone parents, Singles and two-parent families in Canada, 1984 to 2004*. Statistics Canada, Analytical Studies Branch.

Mullainathan, S., & Shafir, E. (2013). Scarcity: Why Having Too Little Means So Much. Macmillan.

OECD. (2017). *G20/OECD INFE report on adult financial literacy in G20 countries* (Research Report) (p. 80). Paris, France: Organization for Economic Co-operation and Development.

Pew Charitable Trusts (2017). How Income Volatility Interacts with American Families' Financial Security. Research Brief. March.

Plunkett, H. R., & Buehner, M. J. (2007). The relation of general and specific locus of control to intertemporal monetary choice. *Personality and Individual Differences*, *42*(7), 1233-1242.

Robson, J. & Peetz, J. (2018). The role of income volatility in financial literacy and economic beliefs. Report prepared for Chartered Professional Accountants Canada

Robson, J., & Splinter, J. (2015). *A new (and better) way to measure individual financial capability* (Research report to VanCity Credit Union) (p. 17). Ottawa: Carleton University.

Rotter, J. B. (1954). *Social learning and clinical psychology*. Johnson Reprint Corporation.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological monographs: General and applied*, *80*(1), 1.

Russia Financial Literacy and Education Trust Fund. (2013). *Women and Financial Literacy: OECD/INFE Evidence, Survey and Policy Responses* (Research Report) (p. 131). Washington D.C.: The World Bank.

Shephard, D., Contreros, J. M., Meuris, J., te Koot, A., Bailey, S., Custers, A., & Spencer, N. (2017). *Beyond Financial Literacy: The Psychological Dimensions of Financial Capability* (Discussion Paper) (p. 5). Think Forward Initiative. Retrieved from https://www.thinkforwardinitiative.com/research/the-psychological-dimensions-of-financial-capability

Statistics Canada. (2008). Canadian Financial Capability Survey. Statistics Canada. Retrieved from http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&Id=53283.

Statistics Canada. (2014). Canadian Financial Capability Survey. Statistics Canada. Retrieved from http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5159.

Sumarwan, U., & Hira, T. K. (1993). The effects of perceived locus of control and perceived income adequacy on satisfaction with financial status of rural households. *Journal of Family and Economic Issues*, *14*(4), 343-364.

TD Bank Group (2017). The impact of income volatility. Retrieved from https://td-capa.s3.amazonaws.com/prod/default/0001/01/2ed95a1a680ea5b78ab53646f1f432f51405bc02.pdf

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063.

7. Appendices

7.1 Appendix A: Materials for Study 2

Note. All participants answered all questions unless otherwise indicated.
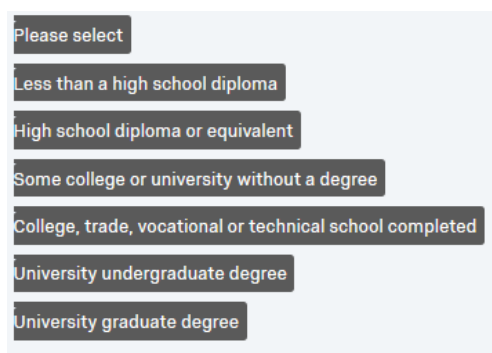*****indicate page breaks**

Survey Study 2

First, we'd like to know a little about you, to help us describe the sample of our study better.

1. Are you …?
    Male
    Female
    Other

2. How old are you? *[text box]*

3. What is the highest level of education that you have completed?

Please select
Less than a high school diploma
High school diploma or equivalent
Some college or university without a degree
College, trade, vocational or technical school completed
University undergraduate degree
University graduate degree

4. How many people live in your household (including yourself)?
    __ adults
    __ children

5. What is your marital status?
    Single, never married
    Separated or divorced
    widowed
    Married or common-law.

6. Do you live in a home that you
    Rent
    Own
    Do not rent or own

****

We now have some questions about your finances. When reflecting on these questions, please provide answers as they pertain to you personally rather than to the entire household.

1. Which best describes your total annual personal income, before taxes?

Under $20,000
$20,000 – $29,999
$30,000 – $39,999
$40,000 – $49,999
$50,000 – $59,999
$60,000 – $69,999
$70,000 – $79,999
$80,000 – $99,999
$100,000 – $124,999
$125,000 – $149,999
$150,000 or more
99. Prefer not to say

2. Which of the following is your main source of income?

government benefits
self-employment
employment, paid by the hour
salaried employment
pension
investments
other

3. How often do you receive your main source income?

Less than once per month
Once per month
Every 2 weeks / twice per month
Once per week
It varies from month to month
Other: please describe:_____

4. How many different sources of income do you personally have in a typical month? (please count both formal and informal sources of income, count both regular income and those that may pay irregularly)

1, 2, 3, 4, 5, 6 or more

*****

5a. How much does the amount of money you make change from month to month?

Amount of income is the same every month						Amount of income changes a lot from month to month
1	2	3	4	5	6	7

5b. How much of a change from one month to the next would feel like a big change in your personal income?

Less than 5%
Between 5% and 10%
Between 11% and 20%
Between 21% and 30%
More than 30%

5c. To what degree do you feel you can control how much money you make in a month?

I have no control at all	I have a little control	I have some control	I have a lot of control	I have all the control
1	2	3	4	5

6a. How much does the source (where the money comes from) change from month to month?

Same source of income every month						The sources of income change a lot from month to month
1	2	3	4	5	6	7

6b. To what degree do you feel you can control where the money you make comes from?

I have no control at all	I have a little control	I have some control	I have a lot of control	I have all the control
1	2	3	4	5

*****

7. Overall, which of these three income types describes your personal situation best?
  1. My income is stable.
  2. My income varies and I have no control over how it varies (for example, I rely on a placement agency to arrange work or rely on a case worker to determine benefit levels)
  3. My income varies and I have control over how it varies (for example, I can decide how much to make)

*****

8. Are you currently working (working for wages or salary, self-employed or working as an unpaid worker in a family business) ?
  Yes – *Answer Question 9*
  No – *Skip to Question 10*

9. We would like to learn a bit more about your day-to-day work experiences. Thinking overall about your current work,

How often can you decide <u>how much</u> you work (i.e., the number of hours)?

Never	Rarely	Sometimes	Most of the time	Always
1	2	3	4	5

How often can you decide <u>when</u> you work (i.e., the time of day)?

Never	Rarely	Sometimes	Most of the time	Always
1	2	3	4	5

How often can you decide <u>which tasks you do</u> in a given day? (e.g., which you do first, which you do afterwards)

Never	Rarely	Sometimes	Most of the time	Always
1	2	3	4	5

****

10. [Locus of Control] *14 items from Rotter's (1966) general Locus of Control Scale (all items that are not about politics or academics) and 4 items from Furnham's (1986) Economic Locus of Control Scale, internal and chance subscales.*
What do YOU believe? For each statement below, please indicate the extent to which you agree with that statement. There are no right or wrong answers, we are simply interested in your opinions. [*Scale: Strongly disagree, Disagree, Disagree Somewhat, Neither agree nor disagree, Agree Somewhat, Agree, Strongly Agree*]

  1.   Many of the unhappy things in people's lives are partly due to bad luck.
  2.   In the long run people get the respect they deserve in this world.
  3.   No matter how hard you try some people just don't like you.

4. I have often found that what is going to happen will happen.
5. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
6. When I make plans I am almost certain that I can make them work.
7. In my case getting what I want has little or nothing to do with luck.
8. Who gets to be the boss often depends on who was luck enough to be in the right place first.
9. Most people don't realize the extent to which their lives are controlled by accidental happenings.
10. It is hard to know whether or not a person really likes you.
11. In the long run the bad things that happen to us are balanced by the good ones.
12. Many times I feel that I have little influence over the things that happen to me.
13. People are lonely because they don't try to be friendly.
14. What happens to me is my own doing.

1. Saving and careful investing is a key factor in becoming rich.
2. In the long run, people who take very good care of their finances stay wealthy.
3. There is little one can do to prevent poverty.
4. It is chiefly a matter of fate whether I become rich or poor.

*****

11. How is your health in general? (*Arber, Fenn & Meadows, 2014*)
Would you say it is….
very good
good
fair
bad
very bad

12. Life Satisfaction (*Diener, Emmons, Larsen, & Griffin, 1985*)
Please rate the degree to which you agree with each of the following statements. *[1—Strongly disagree to 7—Strongly agree]*

1. In most ways, my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

13. Right now, how stressed do you feel about your financial situation? (*Frone, Russell, & Cooper, 1992*).

Not at all stressed									Extremely stressed
1	2	3	4	5	6	7	8	9	10

*****

14. Financial Solvency (*Frone, Russell, & Cooper, 1992*).
Suppose you were to sell all of your major possessions, turn all of your investments and other assets into cash, and pay all of your debts. Would you be in debt, break even, or have something left over?

15. Would you say the total of your financial assets – all the money you have in bank accounts or investments (other than a pension at work) – is today worth:
Less than $500
$500 to $999
$1000 to $2999
$3000 to $4999

$5000 to $6999
$7000 to $9999
$10000 or more
Prefer not to say

****

Work-Life Interference (*Dupre*)

Many times the stresses we encounter outside of our home life can impact our personal relationships.
Please use the following (never) 1 2   3   4   5 (very often) *scale to indicate the frequency of the following items.*

16.   How often did your job or career interfere with your responsibility at home, such as yard work, cooking, cleaning, repairs, shopping, paying the bills, or child care in the last week?

17.   How often did your job or career keep you from spending the amount of time you would like to spend with your family in the last week?

****

18. Delay Discounting *(Bartels & Rips, 2010; Frederick, Loewenstein, & O'Donoghue, 2002)*
Most people don't like to wait for their money, but are willing to do so if the wait means they receive a little more money. This is called the point of indifference: The point of indifference is the point at which you think the higher amount is worth waiting for the specified amount of time. For how much money would you wait 1 year rather than taking $100 now?
       A. I would be indifferent between $100 tomorrow and $_____ in one year.
       B. I would be indifferent between $100 tomorrow and $_____ in 5 years.
       C. I would be indifferent between $100 tomorrow and $_____ in 10 years.
       D. I would be indifferent between $100 tomorrow and $_____ in 20 years.
       E. I would be indifferent between $100 tomorrow and $_____ in 30 years.
       F. I would be indifferent between $100 tomorrow and $_____ in 40 years.

***
19. Financial risk aversion (Gable, 2000; Frone, Russell, & Cooper, 1992)
(Score range1=strongly agree to 4=strongly disagree)
       1. In terms of investing, safety is more important than returns.
       2. I am more comfortable putting my money in a bank account than in the stock market.
       3. When I think of the word "risk" the term "loss" comes to mind immediately.
       4. Making money in stocks and bonds is based onluck.
       5. I lack the knowledge to be a successful investor.
       6. Investing is too difficult to understand.

****

20. Self-Control strategies

Many of us have little tricks we play on ourselves to make us do the things we ought to do or to keep us from the things we ought to foreswear. Sometimes we put things out of reach for the moment of temptation, sometimes we promise ourselves small rewards, and sometimes we surrender authority to a trustworthy friend who will police our calories or our cigarettes.When it comes to financial decisions (e.g., saving money, foregoing impulse purchases), have you used such tricks and strategies? *Never (1) ----- All the time (7)*

How much po you agree or disagree with each of the following statements? There are no right or wrong answers. We are interested in your ideas. Scale: *Completely Disagree (1) ----- Completely Agree (7)*
       1.   People should be able to resist temptations without resorting to tricks.
       2.   Using tricks instead of will power is only for people who have trouble controlling their urges.
       3.   If people use self-control strategies, it shows they have weak will power.

4.   If people use self-control strategies, it shows they know how to manage their life well.(r)
5.   Using self-control strategies is better than using willpower, it makes life easier. (r)

****

Financial capability items (*Robson and Splinter, 2012*)

21. Thinking of the last 12 months, how well have you been keeping up with your financial commitments?
Having real financial problems and falling behind
Keeping up but it sometimes is a struggle
Keeping up without any problems
I don't know

22. Thinking of the last 12 months, were you ever behind two months in a row or more...
....in paying a bill? (Yes/No/ I don't know)
...in paying your rent or mortgage? (Yes/No/ I don't know)
... in making a loan payment? (Yes/No/ I don't know)

23. Do you have a household budget?
Yes
No
I don't know

24. How often do you stay within your budget? [skip if answer above is "No budget"]
I don't know
Never
Rarely
Usually
Always

25. How often do you usually check the balances on any bank accounts you have?
I don't know
I don't have any accounts
Yearly
Monthly
Every two weeks
Weekly
Daily

26. I keep a close watch on my finances.
I don't know
Agree
Disagree

27. Are you planning ahead financially for when you get to retirement age? A plan could include many things like your own savings, government programs, pensions at work, family help, continuing to work, etc.
I don't know
Yes
No
I'm already retired

28. How confident are you that your household income in retirement will be what you hope for?
I don't know
Not at all confident
Not very confident
Fairly confident
Very confident

29. Do you currently have a will?
  Yes
  No
  I don't know

30. Do you currently have any insurance policies such as life insurance, renters' insurance or car insurance?
  Yes
  No
  I don't know

31. If you had a large unexpected cost, for example equivalent to your take-home pay for at least 2 weeks, how would you mostly likely cover this expense?
  I don't know
  I couldn't cover that kind of cost
  Go to a pawnbroker or payday lender
  Borrow from a bank or use a credit card
  Borrow from friends or family
  Sell an asset or personal possession
  Use savings

32. I have a clear idea of the financial products I need.
  I don't know
  Agree
  Disagree

33. I always research my choices before I make a decision about money.
  I don't know
  Agree
  Disagree

34. Are there financial things that you personally keep an eye on? Mark all that apply.
  1. House prices and sales
  2. The stock market
  3. The currency market (ie: Canadian vs other dollars)
  4. Interest rates
  5. Inflation
  6. Taxes
  7. The job market
  8. Pension plans or benefits at work
  9. Sales of consumer goods and services
  10. Other
  11. None of the above. I don't keep an eye on financial things.

35. In the last five years, have you taken a course or program to learn about financial or economic topics?
  Yes
  No
  I don't know

36. How would you rate yourself on each of the following areas of financial management?
(1=Poor, 2 = Fair, 3 = Good, 4 = Very good, 5 = Excellent)
  1. Keeping track of money
  2. Making ends meet
  3. Planning ahead
  4. Shopping around to get the best financial product
  5. Staying informed on financial issues

7.2 Appendix B: Materials for Study 3

Note. All participants answered all questions unless otherwise indicated.
***indicate page breaks
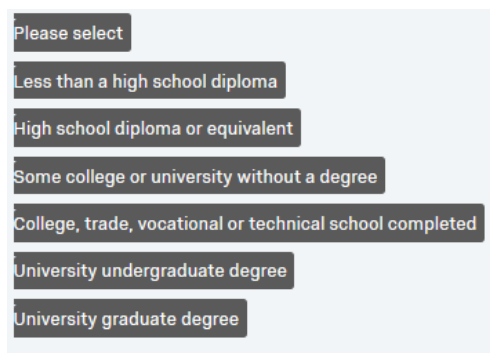
Pre-manipulation survey Study 3

First, we'd like to know a little about you, to help us describe the sample of our study better.

1. Are you …?
    Male
    Female
    Other

2. How old are you? *[text box]*

3. What is the highest level of education that you have completed?

Please select
Less than a high school diploma
High school diploma or equivalent
Some college or university without a degree
College, trade, vocational or technical school completed
University undergraduate degree
University graduate degree

4. How many people live in your household (including yourself)?
    __ adults
    __ children

5. What is your marital status?
    Single, never married
    Separated or divorced
    widowed
    Married or common-law.

6. Do you live in a home that you
    Rent
    Own
    Do not rent or own

*****

We now have some questions about your finances. When reflecting on these questions, please provide answers as they pertain to you personally rather than to the entire household.

1. Which best describes your total annual personal income, before taxes?
    Under $20,000
    $20,000 – $29,999
    $30,000 – $39,999
    $40,000 – $49,999

$50,000 – $59,999
$60,000 – $69,999
$70,000 – $79,999
$80,000 – $99,999
$100,000 – $124,999
$125,000 – $149,999
$150,000 or more
99. Prefer not to say

2. Which of the following is your main source of income?
government benefits
self-employment
employment, paid by the hour
salaried employment
pension
investments
other

3. How often do you receive your main source income?
Less than once per month
Once per month
Every 2 weeks / twice per month
Once per week
It varies from month to month
Other: please describe:_____

4. How many different sources of income do you personally have in a typical month? (please count both formal and informal sources of income, count both regular income and those that may pay irregularly)
1, 2, 3, 4, 5, 6 or more

*****

5a. How much does the amount of money you make change from month to month?

Amount of income is the same every month						Amount of income changes a lot from month to month
1	2	3	4	5	6	7

5b. How much of a change from one month to the next would feel like a big change in your personal income?
Less than 5%
Between 5% and 10%
Between 11% and 20%
Between 21% and 30%
More than 30%

5c. To what degree do you feel you can control how much money you make in a month?

I have no control at all	I have a little control	I have some control	I have a lot of control	I have all the control
1	2	3	4	5

6a. How much does the source (where the money comes from) change from month to month?

Same source of income every month						The sources of income change a lot from month to month
1	2	3	4	5	6	7

6b. To what degree do you feel you can control where the money you make comes from?

I have no control at all	I have a little control	I have some control	I have a lot of control	I have all the control
1	2	3	4	5

*****

7. Overall, which of these three income types describes your personal situation best?

1. My income is stable.

2. My income varies and I have no control over how it varies (for example, I rely on a placement agency to arrange work or rely on a case worker to determine benefit levels)

3. My income varies and I have control over how it varies (for example, I can decide how much to make)

*****

8. Are you currently working (working for wages or salary, self-employed or working as an unpaid worker in a family business) ?

Yes

No – *Skip to next set of questions*

9. We would like to learn a bit more about your day-to-day work experiences. Thinking overall about your current work,

How often can you decide how much you work (i.e., the number of hours)?

Never	Rarely	Sometimes	Most of the time	Always
1	2	3	4	5

How often can you decide when you work (i.e., the time of day)?

Never	Rarely	Sometimes	Most of the time	Always
1	2	3	4	5

How often can you decide which tasks you do in a given day? (e.g., which you do first, which you do afterwards)

Never	Rarely	Sometimes	Most of the time	Always
1	2	3	4	5

****

10. [Locus of Control] What do YOU believe? For each statement below, please indicate the extent to which you agree with that statement. There are no right or wrong answers, we are simply interested in your opinions. [Scale: Strongly disagree, Disagree, Disagree Somewhat, Neither agree nor disagree, Agree Somewhat, Agree, Strongly Agree]

14 items from Rotter's (1966) general Locus of Control Scale (all items that are not about politics or academics) and 4 items from Furnham's (1986) Economic Locus of Control Scale, internal and chance subscales.

1.   Many of the unhappy things in people's lives are partly due to bad luck.
2.   In the long run people get the respect they deserve in this world.
3.   No matter how hard you try some people just don't like you.
4.   I have often found that what is going to happen will happen.
5.   Becoming a success is a matter of hard work, luck has little or nothing to do with it.
6.   When I make plans I am almost certain that I can make them work.
7.   In my case getting what I want has little or nothing to do with luck.
8.   Who gets to be the boss often depends on who was luck enough to be in the right place first.
9.   Most people don't realize the extent to which their lives are controlled by accidental happenings.
10.   It is hard to know whether or not a person really likes you.
11.   In the long run the bad things that happen to us are balanced by the good ones.
12.   Many times I feel that I have little influence over the things that happen to me.
13.   People are lonely because they don't try to be friendly.
14.   What happens to me is my own doing.

1. Saving and careful investing is a key factor in becoming rich.
2. In the long run, people who take very good care of their finances stay wealthy.
3. There is little one can do to prevent poverty.
4. It is chiefly a matter of fate whether I become rich or poor.

 ****

11. How is your health in general? (*Arber, Fenn & Meadows, 2014*)
Would you say it is….
> very good
> good
> fair
> bad
> very bad

12. Life Satisfaction (*Diener, Emmons, Larsen, & Griffin, 1985*)
Please rate the degree to which you agree with each of the following statements.
[1—Strongly disagree to 7—Strongly agree]

6. In most ways, my life is close to my ideal.
7. The conditions of my life are excellent.
8. I am satisfied with my life.
9. So far I have gotten the important things I want in life.
10. If I could live my life over, I would change almost nothing.

13. Right now, how stressed do you feel about your financial situation? (*Frone, Russell, & Cooper, 1992*).

Not at all stressed									Extremely stressed
1	2	3	4	5	6	7	8	9	10

****

14. Financial Solvency (*Frone, Russell, & Cooper, 1992).*
Suppose you were to sell all of your major possessions, turn all of your investments and other assets into cash, and pay all of your debts. Would you be in debt, break even, or have something left over?

15. Would you say the total of your financial assets – all the money you have in bank accounts or investments (other than a pension at work) – is today worth:
> Less than $500
> $500 to $999
> $1000 to $2999
> $3000 to $4999
> $5000 to $6999
> $7000 to $9999
> $10000 or more
> Prefer not to say

****

Work-Life Interference (*Dupre*)
Many times the stresses we encounter outside of our home life can impact our personal relationships.

Please use the following (never) 1 2 3 4 5 (very often) *scale to indicate the frequency of the following items.*

16.   How often did your job or career interfere with your responsibility at home, such as yard work, cooking, cleaning, repairs, shopping, paying the bills, or child care in the last week?

17.   How often did your job or career keep you from spending the amount of time you would like to spend with your family in the last week?

****

18. Self-Control strategies

Many of us have little tricks we play on ourselves to make us do the things we ought to do or to keep us from the things we ought to foreswear. Sometimes we put things out of reach for the moment of temptation, sometimes we promise ourselves small rewards, and sometimes we surrender authority to a trustworthy friend who will police our calories or our cigarettes.When it comes to financial decisions (e.g., saving money, foregoing impulse purchases), have you used such tricks and strategies? *Never (1) ----- All the time (7)*

How much po you agree or disagree with each of the following statements? There are no right or wrong answers. We are interested in your ideas. Scale: *Completely Disagree (1) ----- Completely Agree (7)*
>   6.   People should be able to resist temptations without resorting to tricks.
>   7.   Using tricks instead of will power is only for people who have trouble controlling their urges.
>   8.   If people use self-control strategies, it shows they have weak will power.
>   9.   If people use self-control strategies, it shows they know how to manage their life well.(r)
>   10.   Using self-control strategies is better than using willpower, it makes life easier. (r)

****

Financial capability items (*Robson and Splinter, 2012*)

19. Thinking of the last 12 months, how well have you been keeping up with your financial commitments?
>   Having real financial problems and falling behind
>   Keeping up but it sometimes is a struggle
>   Keeping up without any problems
>   I don't know

20. Thinking of the last 12 months, were you ever behind two months in a row or more...
>   **....in paying a bill?** (Yes/No/ I don't know)
>   **...in paying your rent or mortgage?** (Yes/No/ I don't know)
>   **... in making a loan payment?** (Yes/No/ I don't know)

21. Do you have a household budget?
>   Yes
>   No
>   I don't know

22. How often do you stay within your budget? [skip if answer above is "No budget"]
>   I don't know
>   Never
>   Rarely
>   Usually
>   Always

23. How often do you usually check the balances on any bank accounts you have?

    I don't know
    I don't have any accounts
    Yearly
    Monthly
    Every two weeks
    Weekly
    Daily

24. I keep a close watch on my finances.

    I don't know
    Agree
    Disagree

25. Are you planning ahead financially for when you get to retirement age? A plan could include many things like your own savings, government programs, pensions at work, family help, continuing to work, etc.

    I don't know
    Yes
    No
    I'm already retired

26. How confident are you that your household income in retirement will be what you hope for?

    I don't know
    Not at all confident
    Not very confident
    Fairly confident
    Very confident

27. Do you currently have a will? (Yes/No/ I don't know)

28. Do you currently have any insurance policies such as life insurance, renters' insurance or car insurance?

    Yes
    No
    I don't know

29. If you had a large unexpected cost, for example equivalent to your take-home pay for at least 2 weeks, how would you mostly likely cover this expense?

    I don't know
    I couldn't cover that kind of cost
    Go to a pawnbroker or payday lender
    Borrow from a bank or use a credit card
    Borrow from friends or family
    Sell an asset or personal possession
    Use savings

30. I have a clear idea of the financial products I need.

    I don't know
    Agree
    Disagree

31. I always research my choices before I make a decision about money.

    I don't know
    Agree
    Disagree

32. Are there financial things that you personally keep an eye on? Mark all that apply.
1. House prices and sales
2. The stock market
3. The currency market (ie: Canadian vs other dollars)
4. Interest rates
5. Inflation
6. Taxes
7. The job market
8. Pension plans or benefits at work
9. Sales of consumer goods and services
10. Other
11. None of the above. I don't keep an eye on financial things.

33. In the last five years, have you taken a course or program to learn about financial or economic topics?
Yes
No
I don't know

34. How would you rate yourself on each of the following areas of financial management?
(1=Poor, 2 = Fair, 3 = Good, 4 = Very good, 5 = Excellent)
1. Keeping track of money
2. Making ends meet
3. Planning ahead
4. Shopping around to get the best financial product
5. Staying informed on financial issues

****

Please let the experimenter know that you have finished the first part of the study.

****

MANIPULATION: The Income Game Tasks (participants were assigned to one of three conditions and task instructions. The instructions were also read by RA)

This is the income game. There will be three periods of "work" with a brief break in between. Each work period is 7 minutes long, each rest period is 2 minutes long. The research experimenter will let you know when it's time to end and start the work periods.

GIG CONDITION
The income game includes a number of different tasks. If you finish one task, sometimes you may have to wait for another one to be available, sometimes there may be several available right away.
You will be paid in points for each completed task, tasks are worth different amounts of points.

SELF-EMPLOYED CONDITION
Tasks will be made available to you, and you can choose when to take a new task you want to work on by clicking on the next task button on the bottom of the page. You can also chose to skip a task if you don't want to work on it. You will be paid in points for each completed task, tasks are worth different amounts of points. You can decide to work as much or as little as you want.

SALARY CONDITION

The income game includes a number of different tasks. Please work through each of the tasks at your own pace until the end of the period. You can scroll up and down to see all the tasks. You will be paid full points for each period as long as you work on these tasks.

Examples of Tasks:

Find the differences: Find the differences between the two pictures and circle them.

Mental Rotation task
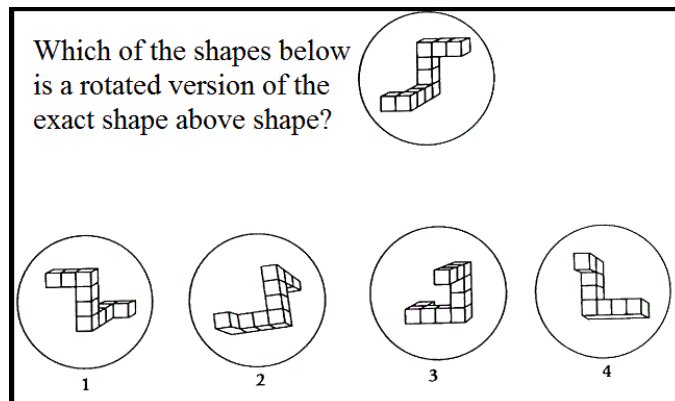
Word analogies: The analogies below are word problems that consist of two-word pairs. Look at the first pair and decide how the two words relate to each other. Then select one of the words below so the second pair of words has the same relationship.

1. Nest : Bird
a. Cave : bear
b. flower : petal
c. window : house
d. dog : basket

2. Loud : Noisy is like Smart: _____
a. heavy
b. intelligent
c. lovely
d. perfect

Find Word Pairs: Which of the words on the left goes with which of the words on the right?

		Example that participants would see:	
things that go together	bat/ball, bow/arrow, salt/pepper, bread/butter, fork/knife	bat bow salt	arrow pepper knife

		bread	butter
		fork	ball
opposites	big/small, stop/go, hot/cold, tall/short, wide/narrow, early/late, graceful/clumsy, laugh/cry, dark/light, sharp/dull	big hot tall sharp dark	light short cold small dull

Global/Local Processing task (Kimchi, and Palmer, 1982)

Please give your immediate and spontaneous impression about which of the two comparison figures (bottom) looks more similar to the standard figure (top).
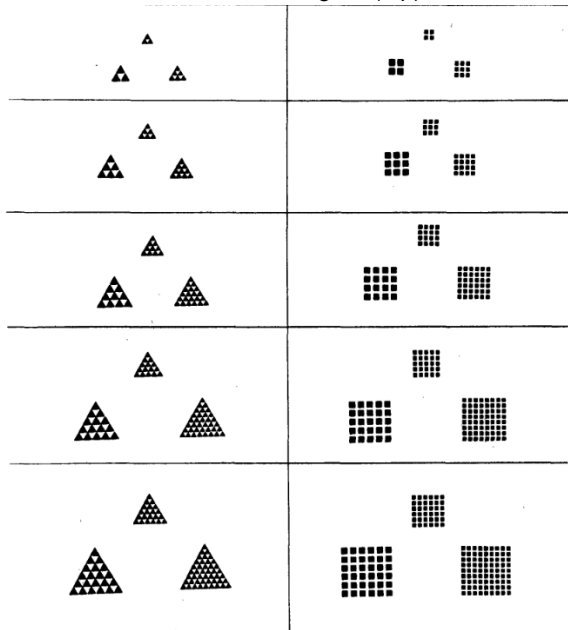
Post-manipulation Survey STUDY 3

***

35. *14 items from Rotter's (1966) Locus of Control Scale (all items that are not about politics or academics specifically) and 4 items from Furnham's (1986) Economic Locus of Control Scale, internal and chance subscales. – FORM B*

What do YOU believe? For each statement below, please indicate the extent to which you agree with that statement. There are no right or wrong answers, we are simply interested in your opinions. [Scale: Strongly disagree, Disagree, Disagree Somewhat, Neither agree nor disagree, Agree Somewhat, Agree, Strongly Agree]

1. People's misfortunes result from the mistakes they make.
2. Unfortunately, an individual's worth often passes unrecognized, no matter how hard (s)he tries
3. People who can't get others to like them don't understand how to get along with others.
4. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
5. Getting a good job depends mainly on being in the right place at the right time.
6. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
7. Many times we might just as well decide what to do by flipping a coin.
8. Getting people to do the right thing depends on ability, luck has little or nothing to do with it.
9. There really is no such thing as "luck".

10. How many friends you have depends on how nice a person you are.
11. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
12. It is impossible for me to believe that chance or luck plays an important role in my life.
13. There is not much use in trying too hard to please people, if they like you, they like you.
14. Sometimes I feel that I don't have enough control over the direction my life is taking.

1. Whether or not I become wealthy depends mostly on my ability.
2. If I become poor, it's usually my own fault.
3. Regarding money, there isn't much you can do for yourself when you are poor.
4. Only those who inherit or win money can possibly become rich.

***

36. Financial risk aversion (*Gable, 2000; Frone, Russell, & Cooper, 1992*)
(Score range1=strongly agree to 4=strongly disagree)
     1. In terms of investing, safety is more important than returns.
     2. I am more comfortable putting my money in a bank account than in the stock market.
     3. When I think of the word "risk" the term "loss" comes to mind immediately.
     4. Making money in stocks and bonds is based onluck.
     5. I lack the knowledge to be a successful investor.
     6. Investing is too difficult to understand.
***

37. Delay Discounting (*Bartels & Rips, 2010; Frederick, Loewenstein, & O'Donoghue, 2002*)
Most people don't like to wait for their money, but are willing to do so if the wait means they receive a little more money. This is called the point of indifference: The point of indifference is the point at which you think the higher amount is worth waiting for the specified amount of time. For how much money would you wait 1 year rather than taking $100 now?
     A. I would be indifferent between $100 tomorrow and $_____ in one year.
     B. I would be indifferent between $100 tomorrow and $_____ in 5 years.
     C. I would be indifferent between $100 tomorrow and $_____ in 10 years.
     D. I would be indifferent between $100 tomorrow and $_____ in 20 years.
     E. I would be indifferent between $100 tomorrow and $_____ in 30 years.
     F. I would be indifferent between $100 tomorrow and $_____ in 40 years.

***

38. Positive Affect Negative Affect Scale (*PANAS,*** Watson, Clark, & Tellegen, 1988)**

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel like this RIGHT NOW. Use the following scale to record your answers.

1	2	3	4	5
very slightly or not at all	*a little*	*moderately*	*quite a bit*	*extremely*

1. interested
2. distressed
3. excited
4. upset
5. strong
6. guilty
7. scared
8. hostile
9. enthusiastic

10. proud
11. irritable
12. alert
13. ashamed
14. inspired
15. nervous
16. determined
17. attentive
18. jittery
19. active
20. afraid

***

39. Manipulation check of the income game:

A. How much control did you feel you had over the number of tasks you completed?
(1) No control – A lot of control (7)

B. How much control did you feel you had over the number of points earned during the game (i.e., your "income")? *(1) No control – A lot of control (7)*

C. How much control did you feel you had over the type of tasks you completed?
(1) No control – A lot of control (7)

D. How much did the payout (i.e., points/"income") change between tasks?
(1) No Change – A lot of change between tasks (7)

E. How stable were the points you earned (i.e. the "income") from task to task?
(1) Very Stable – Not Stable at all (7)

***

40. How much did you enjoy the income game? *(1) Not at all – Very (7)*
41. How stressed did you feel during the income game? *(1) Not at all – Very (7)*
42. How fast did the time pass during the income game? *Time felt very slow – Time felt like it passed quickly*

***

The experimenter should have downloaded the total amount of money you've earned in the Income game by now. Please stop the survey here and check with the experimenter about how much $$ you earned today.
(We still have two more questions for you after this brief break)

***

Experimenter script:

You earned $15 dollar during the Income game! We will pay out this money in Amazon or Walmart gift cards sent to your email. Now you have two options. You can take the $15 right now, after you answer the final two questions, or you can "save" your money and receive $17 in two weeks.

Which gift card would you prefer: Amazon or Walmart?
Would you like to take $15 now or $17 in two weeks?

Great, I'll enter the amount and delivery date here. I'll just need you to enter the email address you'd like this money to be sent to and click "next"

***

43. Did you choose to be paid for the income game right away or did you choose to wait?
  I chose payment now ($15) vs I chose to wait ($17).

44. How much more money would you need before the amount is worth the wait?
  (e.g., if you had to choose between $15 now and $20 in a week but chose to be paid now, would you have
  waited if it was $30?) I would have waited if the payout in one week had been $___

7.3 Appendix C: Robustness check analysis for financial well-being variables in Study 2

Table 5.
Estimated (adjusted) means by self-classified income profile controlling for demographic variables (Study 2)

	"My income varies and I have no control over how it varies"	"My income varies and I have control over how it varies"	"My income is stable"	*ANOVA*
Self-reported financial stress	3.48_a (1.04)	2.73_b (1.12)	2.53_c (1.12)	F = 40.61, p < 0.001
Age				F = 12.17, p = 0.001
Sex (indicator variable: female)				F = 0.09, p = 0.760
Marital status (indicator: married)				F = 0.51, p = 0.474
Education (5 levels)				F = 36.41, p < .0.001
Income amount (11 levels)				F = 3.27, p = .071
Making ends meet	223.40_a (61.42)	243.98_b (44.38)	243.86_b (41.27)	F = 11.86, p <0.001
Age				F = 2.10, p = 0.148
Sex (indicator variable: female)				F = 1.46, p = 0.227
Marital status (indicator: married)				F = 10.34, p = 0.001
Education (5 levels)				F = 3.80, p = 0.052
Income amount (11 levels)				F = 4.42, p = 0.036
Keeping track of money	49.34_a (11.03)	49.91_a (9.10)	49.68_a (8.71)	F = 0.20, p = 0.817
Age				F = 1.28, p = 0.259
Sex (indicator variable: female)				F = 0.57, p = 0.450
Marital status (indicator: married)				F = 15.56, p < 0.001
Education (5 levels)				F = 1.48, p = 0.225
Income amount (11 levels)				F = 3.75, p = 0.053
Choosing products	7.20_a (1.01)	7.47_b (0.93)	7.47_b (0.91)	F = 4.37, p =0.013
Age				F = 0.43, p = 0.514
Sex (indicator variable: female)				F = 3.81, p = 0.051
Marital status (indicator: married)				F = 8.59, p = 0.003
Education (5 levels)				F = 18.08, p < 0.001
Income amount (11 levels)				F = 3.71, p = 0.055
Staying informed	4.54_a (1.21)	4.82_b (1.36)	4.71_c (1.22)	F = 2.62, p = 0.073
Age				F = 8.08, p = 0.005
Sex (indicator variable: female)				F = 19.70, p < 0.001
Marital status (indicator: married)				F = 1.92, p = 0.166
Education (5 levels)				F = 71.85, p < 0.001
Income amount (11 levels)				F = 4.40, p = 0.036
Planning ahead	7.73_a (8.72)	6.65_b (6.46)	6.63_b (5.29)	F = 1.72, p = 0.179
Age				F = 6.35, p = 0.012
Sex (indicator variable: female)				F = 0.35, p = 0.557
Marital status (indicator: married)				F = 1.50, p = 0.221
Education (5 levels)				F = 1.10, p = 0.294
Income amount (11 levels)				F = 0.58, p = 0.446

The authors

Dr. Johanna Peetz, Associate Professor of Psychology at Carleton University.
E-mail: Johanna.peetz@carleton.ca

Dr. Jennifer Robson, Associate Professor of Political Management at Carleton University.
E-mail: Jennifer.robson@carleton.ca