"The How and Why of Household Reactions to Income Shocks"

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SOCIAL ECONOMICS LAB

Goal 1 of this paper: "How" do Households React?

- Use **newly designed surveys** to better understand households' reactions to shocks.
- Surveys face (justified) skepticism but they provide key advantages. Complementary to other data or methods we can use.
- **Use of hypothetical scenarios with valuable variation:** Allows to recover iMPCs and iMPDs out of income shocks, varying size, timing, & sign of the shock.

  Revealed preference approach challenging due to lack of data & identifying variation.
- **Can study new heterogeneity:** Econ & financial circumstances, but also (hard to get from other data) past experiences, perceptions, expectations, goals & constraints...
- Can be **"in-real-time" and context-specific**: Parameters are not immutable so it's valuable to have recurrent and recent info.
- For the results to be reliable, it is critical that these surveys are well-designed, carefully calibrated, and deployed on appropriate samples.

Goal 2: "Why" do households react the way they do?

- **Model selection:** Several models can be observationally equivalent, especially given the (often limited) data we have.
  - Maybe different households function according to different **mental models**.
- Surveys allow us to ask people **more directly** about their **motivations & reasons**.

  Why do households choose to do or not do certain things (spend, save, deleverage)?
- **More specific adjustment margins**: what specific decisions– type of spending, (de)leveraging, saving, labor supply- are affected by the shock?

  E.g., deleveraging by paying mortgage versus repaying late bills.
- **Puzzles:** Combo of key parameter estimates and underlying motivations can help resolve some "puzzles"
  - Which are often puzzles exactly because we don't understand households' reasons!

But can we trust survey responses to predict behaviors?

Paper	Estimate	Sample	Value	Our estimate
Patterson (2023)	**MPC** out of income loss due to unemp.	CEX, PSID	.53	.59 (.024)
Kaplan et al. (2014)	Share of HtM households	SCF	.31	.31 (.013)
	Share of wealthy HtM out of total HtM		.62	.64 (.036)
Chetty and Szeidl (2007)	Share of committed expenditures	CEX, PSID	0.5 (update: 0.6)	.62 (.005)
Baugh et al. (2021)	**MPC** out of tax refund, 30 days before receipt	Admin data, account aggregator	.001	.01 (.002)
	MPC out of tax refund, 30 days after receipt		.07	.091 (.009)
	MPC out of tax refund, 30-60 days after receipt		.03	.096 (.009)
Baugh et al. (2021)	**MPC** out of tax payment, 30 days before due	Admin data, account aggregator	.001	.044 (.007)
	MPC out of tax payment, 30 days after due		.001	.026 (.004)
	MPC out of tax payment, 30-60 days after due		.01	.02 (.004)
Di Maggio et al. (2017)	**Car spending/initial mort. paym.** out of cuts in mort. paym.	BlackBox Logic, Equifax	.043	.065 (.02)
	Repaym. of mortgage debt/initial mort. paym. out of cuts in mort. paym.		.043	.059 (.008)
Karger and Rajan (2021)	**MPC** out of the first EIP	Facteus bank-account data	.46	.5 (.024)
Misra et al. (2022)	**MPC** out of the first EIP	Facteus data, ZIP code level	.51	
Chetty et al. (2023)	**MPC** out of the first EIP	Affinity Solutions, aggregated data	.37-.61	

Survey and Sample

Sample and Representativeness

New survey of ≈ 3,000 U.S. respondents Nov 2022- Jan 2023. (Older wave May-Oct 2021 with ≈ 1300 respondents).

- Distributed through commercial survey company (*Lucid*).
- Representative of respondents in labor force and aged 25-65.
- ≈ 25 minutes long.

Quotas on targeted characteristics: age, annual household gross income, gender & race to match U.S. target population.

Data quality: robust sample (exclude respondents based on abnormal time to complete, patterns in closed-ended questions, inconsistencies in open-ended questions).

Targeted characteristics *Non-targeted characteristics* *Survey flow*

Survey Flow

1. Household socio-economic & decision-making
Background, finances, hurdles, usual spending & saving behavior

↓

HOW households react: quantitative elicitation of iMPCs and iMPDs
Randomize: shock size (proportional 10% vs. fixed $1000), sign (positive/negative), timing (now vs. 1–2 quarters ahead)

↓

WHY households react this way: in-depth elicitation of adjustment margins and reasons
Randomize sign order

↓

4. Detailed assets & liabilities
Real estate, vehicles, accounts, retirement, mortgages, student loans, credit cards; co-holding

Using an LLM chatbot to elicit responses to income shocks

- Great opportunity to turn the complex series of closed-ended questions (Block 3: **WHY**) into a much more **"contingent," "adapt as you go"** flow.
- Currently collecting data. Results seem robust, but this is a smoother way of doing it.

Live Demo *Screenshots of chatbot* *Snippets of prompt*

Quantitative Estimation of iMPCs and iMPDs

Suppose that today you learn that you and your household will receive an **unexpected, one-time payment** of $1000. You can think of this payment as a government stimulus check, tax refund, bonus, inheritance, gift, or lottery win. This one-time payment, which will not be taxed, will be available on your bank account or as a check in your mailbox within a few days.

Now, consider ways in which you and your household could use this additional income:

1. **Additional spending:** purchases of durable goods (e.g., cars, furniture, jewelry, etc.) or non-durable goods and services that do not last for a long time (e.g., food, clothes, vacation, etc.) in addition to those you have already planned.
2. **Additional debt repayments:** principal and interest payments to reimburse outstanding debt (e.g., credit card debts, mortgages, student and consumer loans, etc.) in addition to those you have already planned.
3. **Savings:** amount of additional income that is neither spent nor used to repay debt. It is left for future use, for instance by depositing it in checking, savings, or pension accounts, or by purchasing financial assets.

Suppose that today you and your household receive a one-time payment of the following amount:

$1000

Please enter how you would **allocate this one-time payment to additional spending and debt repayments** in different 3-month periods. Money that you do not use for additional spending and debt repayments during these periods will be **saved for future use**.

	Additional spending	Additional debt repayments
Between today and 3 months from now		
Between 4 and 6 months from now		
Between 7 and 9 months from now		
Between 10 and 12 months from now		

Savings: $1000

Suppose that today you and your household receive a one-time payment of the following amount:

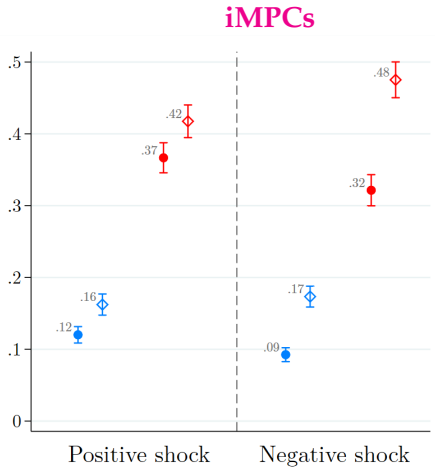
$1000

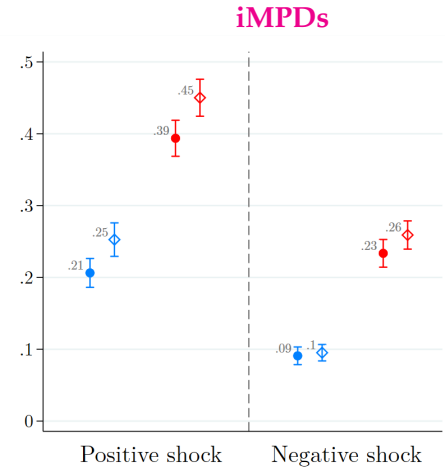
Please enter how you would **allocate this one-time payment to additional spending and debt repayments** in different 3-month periods. Money that you do not use for additional spending and debt repayments during these periods will be **saved for future use**.

	Additional spending	Additional debt repayments
Between today and 3 months from now	400	200
Between 4 and 6 months from now	100	50
Between 7 and 9 months from now	50	
Between 10 and 12 months from now		

Savings: $200

iMPCs and iMPDs out of an income shock



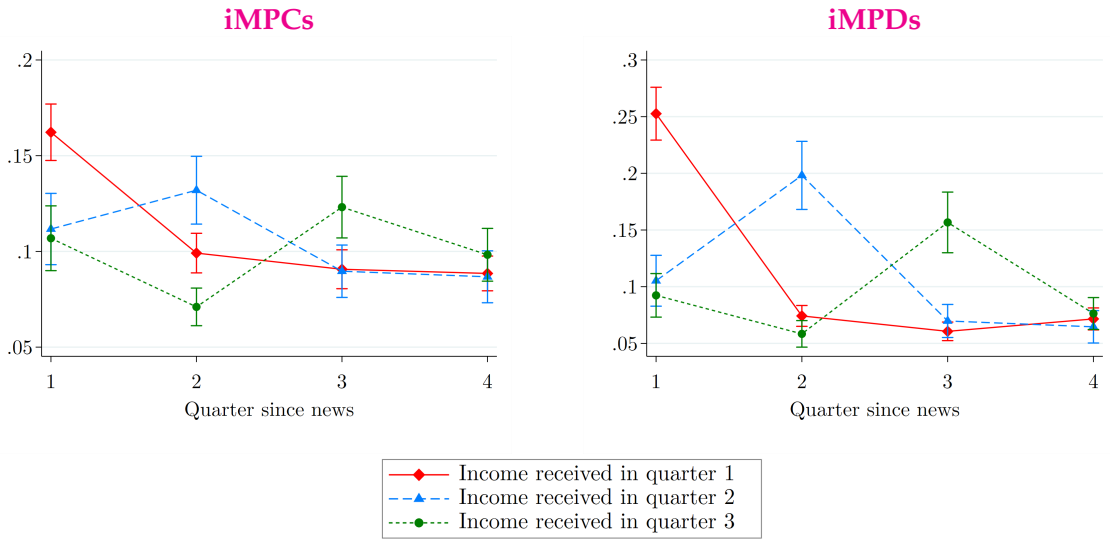


One-quarter (impact) - proportional 10% of income shock
One-quarter (impact) - fixed shock
One-year (cumulative) - proportional 10% of income shock
One-year (cumulative) - fixed shock

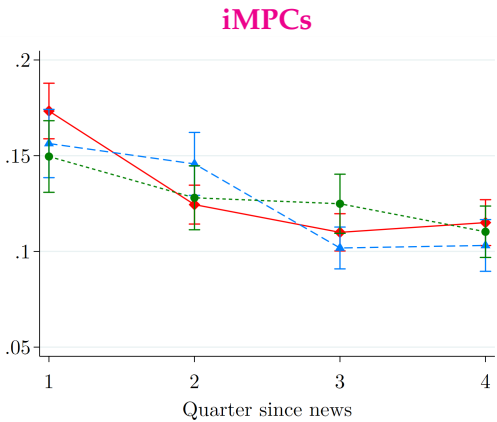
Benchmarking against existing MPCs and MPDs estimates

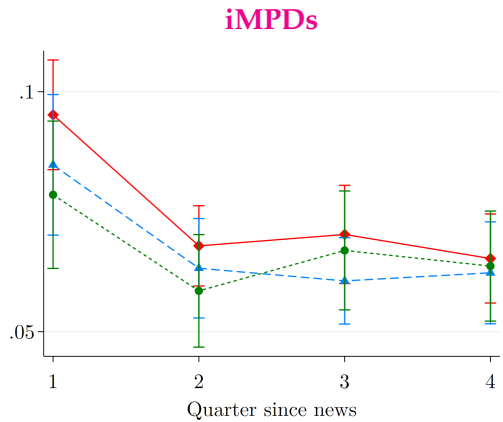
Paper	Time period	Source	Sign	Size	Horizon	MPC Non-Durables	MPC Durables	MPD
Bohem et al. (2025)	05/22	Crédit Mutuel Alliance Fédérale	+	$300	1 month	.17	.06	
Kosar et al. (2023)	06/20	NY Fed SCE	+	$2 400 (median check)	Not specified	.3*		.32
Armantier et al. (2020, 2021)	06/20, 07/20, 03/21	NY Fed SCE	+	$2 400 (median check)	Not specified	.25-.29*		.34-.37
Coibion et al. (2020)	07/20	Nielsen Homescan	+	$2 400 (median check)	Not specified	.35	.07	.31
Parker et al. (2022)	EIP1 04/20	CEX	+	$2 400 (median check)	3 months	.1	.13	
	EIP2 01/21	CEX	+	$1 200 (median check)	3 months	.08	.16	
	EIP1 04/20	CEX	+	$2 400 (median check)	6 months	.12	.33	
	EIP2 01/21	CEX	+	$1 200 (median check)	6 months	.15	.45	
Fagereng et al. (2021)	Lotteries '94–'06	Norwegian admin. data	+	$1 500–150 000 win	1st year	.49	.03	.07
	Lotteries '94–'06	Norwegian admin. data	+	$1 500–150 000 win	2nd year	.2*		.01
Parker et al. (2013)	'08 tax rebate	CEX	+	$300–1.2 K	3 months	.12–.3	.38–.6	
Orchard et al. (2025)	'08 tax rebate	CEX	+	$300–1.2 K	3 months	–.02	.3	
Fuster et al. (2021)	2016–17	NY Fed SCE	+	$500	3 months	.05	.02	
	2016–17	NY Fed SCE	+	$2.5K	3 months	.06	.03	
	2016–17	NY Fed SCE	+	$5K	3 months	.08	.04	
	2016–17	NY Fed SCE	+	$500 in 3 months	3 months	–.01	–.01	
	2016–17	NY Fed SCE	+	$5K in 3 months	3 months	.03	.01	
	2016–17	NY Fed SCE	–	$500	3 months	.26	.06	
Christelis et al. (2019)	2015	Dutch National Bank survey	+	1 month of income	1 year	.2	.19	.15
	2015	Dutch National Bank survey	+	3 months of income	1 year	.14	.22	.16
	2015	Dutch National Bank survey	-	1 month of income	1 year	.24	.26	.07
	2015	Dutch National Bank survey	-	3 months of income	1 year	.24	.27	.07

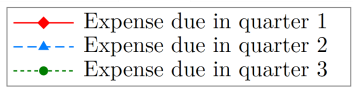
Dynamics: iMPCs and iMPDs for positive $1000 shock



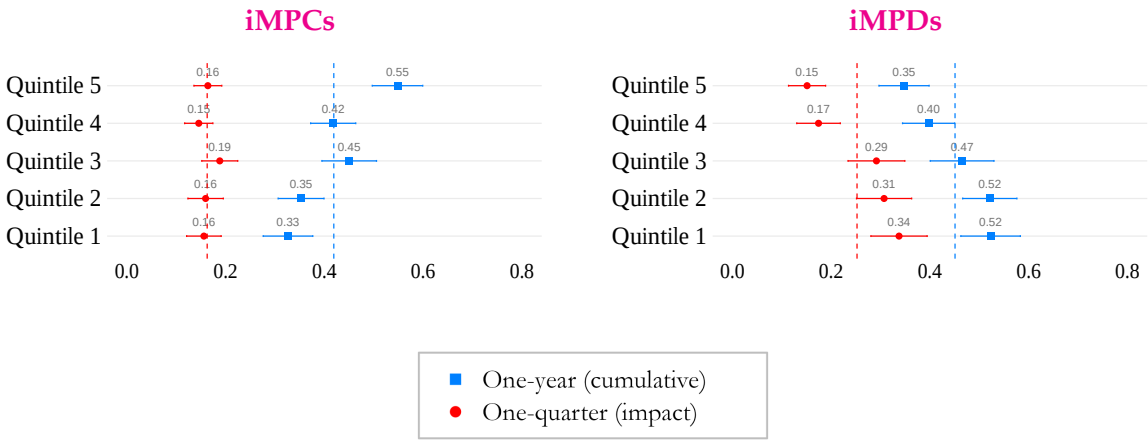
Dynamics: iMPCs and iMPDs for negative $1000 shock



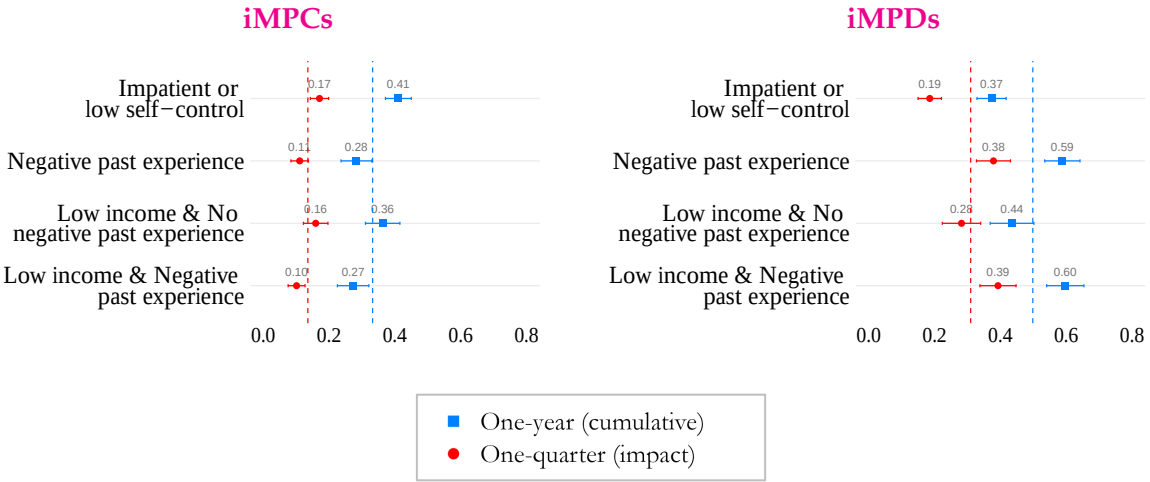




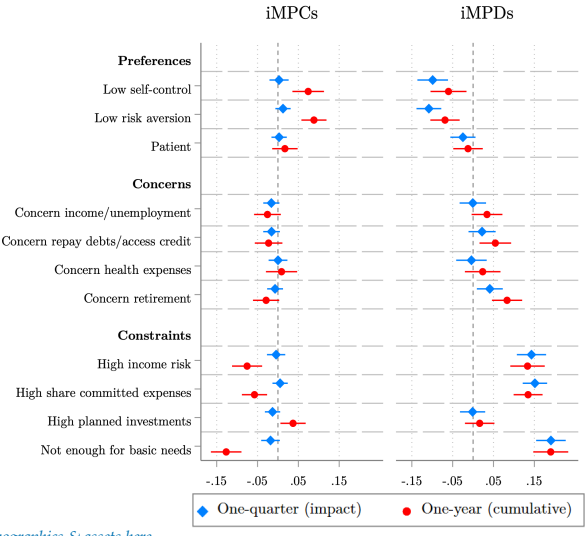
iMPCs and iMPDs and Quintiles of liquid wealth (+$1000 shock)



iMPCs and iMPDs among Low liquidity households (+$1000 shock)



iMPCs and iMPDs Heterogeneity (positive shock)



Negative income shock here; *Demographics & assets here.*

Model Selection

How we elicit the reasons behind households' behaviors

Start by repeating scenarios for positive and negative shocks but now ask how relevant many potential **detailed adjustment margins** are. E.g., instead of just "saving" or "deleveraging" would ask:

> *"Put money into our emergency fund"*
>
> *"Repay late bills that we wouldn't normally pay without this extra money"*
>
> *"Put more money towards our long-term goals (e.g., house purchase, education, or retirement)"*

Ask about **detailed reasons for doing, *not* doing, or not doing more of something**

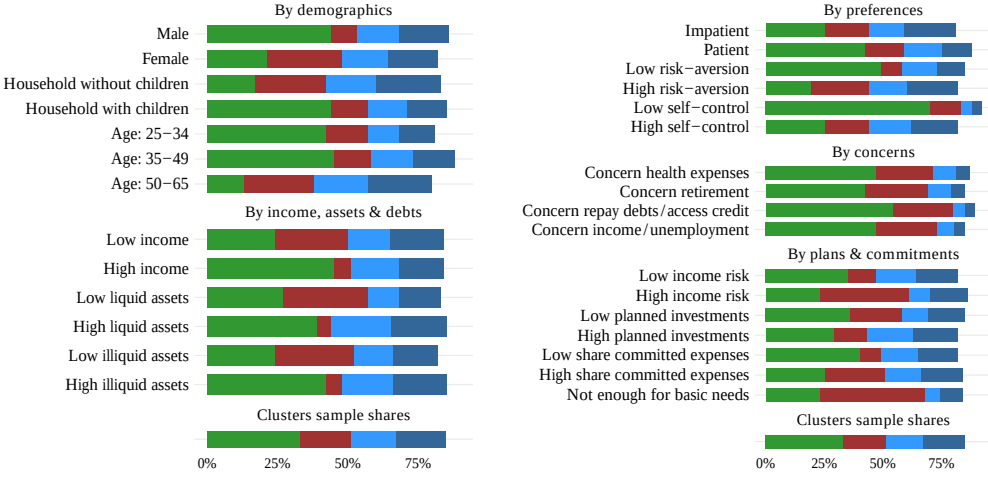
Use **machine learning algorithm to classify households** into "types" based on their adjustment margins and reasons provided (Latent Class Analysis (LCA)).

Distribution of reasons (positive shock) *Distribution of reasons (negative shock)*

Four Household Types (Latent Class Analysis)

Strongly Constrained (18%)	Precautionary (16%)	Quasi-Smoothers (18%)	Spenders (33%)
After (+) shock: Deleverage Low MPCs, high MPDs	**After (+) shock:** Save Low MPCs, low MPDs	**After (+) shock:** Save Slightly higher MPCs, low MPDs	**After (+) shock:** Spend more High MPCs, low MPDs
After (−) shock: Cut spending & borrow Average MPCs, high MPDs on impact	**After (−) shock:** Dip into savings & cut C High MPCs, low MPDs	**After (−) shock:** Dip into savings Slightly lower MPCs, low MPDs	**After (−) shock:** Mix of all Low MPCs, high MPDs
Reasons: Too many debts; future concerns; cannot borrow more	**Reasons:** Concerns about future & long-term goals; buffer stock	**Reasons:** Don't need things; want to smooth C; accessible savings	**Reasons:** Minimize cognitive burden; splurging; easy to borrow
Profile: Older, low income & assets, high risk aversion, high income risk	**Profile:** Somewhat older, higher assets, low debts, high self-control	**Profile:** Older, high assets, low debt, high self-control & risk aversion	**Profile:** Younger, higher income, with children, low self-control

Distribution of clusters for each characteristic



Explaining some Puzzles with the combination of “the how and the why”

Puzzles for constrained households and liquid households

1. Why do constrained households have lower MPCs than richer/wealthier/unconstrained ones?

They mostly focus on deleveraging. Deleveraging takes many forms: credit card debt, paying late bills.

2. Why do already high liquid wealth households exhibit high MPCs?

Spend on leisure and more luxurious items because enjoy splurging or are saving for future expenses ("term liquidity" constrained).

Asymmetry Puzzle

Why do some households respond asymmetrically to positive and negative shocks?

Many households have different-sized MPCs for positive and negative shocks, but 30% are fully asymmetric.

> Asymmetric type 1: spend positive shock but don't cut after negative one (11%).
>
> Asymmetric type 2: don't increase spending after positive shock, but cut after negative (19%).

Different answers for different households:

The Precautionary smooth consumption after positive shock but cut spending after negative one because worry about the future (Asymmetric of type 2)

The Spenders and Quasi-Smoothers increase spending out of desire to indulge when possible, but smooth out negative shocks because they can (Asymmetric type 1).

The Spenders and the Strongly constrained are much more "symmetric."

Co-holding Puzzle

Co-holders: credit-card holders who revolve outstanding balances & hold (low-interest) liquid assets sufficient to repay (high-interest) credit card debts.

21% of the sample, 25% of the sample that owns a credit card.

? and **?** find around 30% of co-holders with SCF data.

Why do people co-hold? We ask them directly by pointing out they have liquid balances $>$ their credit card debt.

Key reasons:

1. Like to keep cash per se or for unexpected expenses;
2. Timing issue: already plan to repay;
3. Manage accounts separately in the household.

Co-holding figure

Key takeaway: Heterogeneity in Household Models

Analysis highlights that **different households do the same thing for different reasons.**

Observational data on adjustments in spending, debt, or savings $\Rightarrow$ limited info about underlying model that households follow (limited predictive power for identifying types).

Key information needed: underlying reasons for choosing specific behaviors or not.

Four main types: strongly constrained, quasi-smoothers, precautionary, spenders.

Lots more to do: What would you ask if you could ask people directly? Complementary to our other approaches.

Conclusion:

THANK YOU!



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Representativeness: Targeted Characteristics

	U.S. Population	Survey
Male	.53	.53
25-29 years old	.13	.13
30-39 years old	.28	.28
40-49 years old	.25	.25
50-59 years old	.24	.24
60-65 years old	.1	.1
$0-$19999	.04	.04
$20000-$39999	.11	.11
$40000-$69999	.2	.2
$70000-$124999	.29	.29
$125000+	.36	.36
White	.61	.73
Black/African-American	.12	.12
Hispanic/Latino	.18	.13
Asian/Asian-American	.07	.03
Full time employed	.78	.79
Part time employed	.09	.08
Self-employed	.1	.08
Unemployed	.03	.05
U.S. total popluation	260329	–
U.S. labor force, age 25-65	129923	–
Sample size	–	2923

Go back

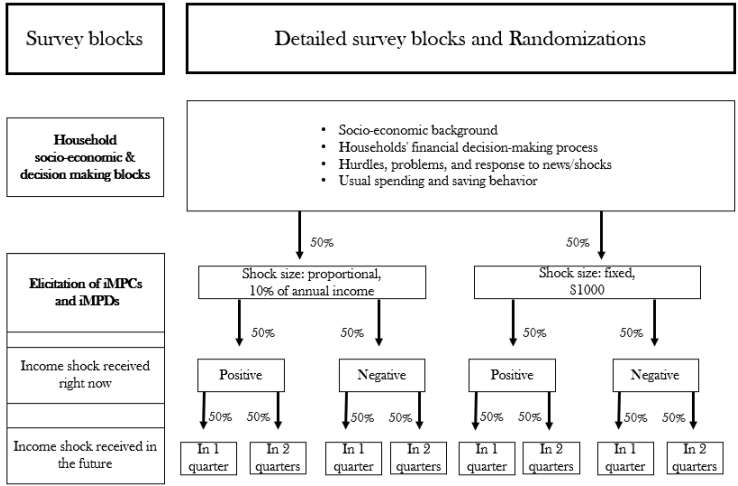
Representativeness: Non-targeted Characteristics

		U.S. Population	Survey
Primary residence:	ownership rate	.64	.75
	value (mean)	368000	339000
	value (median)	243000	325000
Business:	ownership rate	.13	.24
	value (mean)	1235000	623000
	value (median)	105000	300000
Checking accounts:	ownership rate	0.94	.93
	value (mean)	10347	11728
	value (median)	2500	4000
Total assets[1]:	value (mean)	823000	1113000
	value (median)	236000	507000
Mortgages on primary residence:	share with mortgages	.49	.45
	value (mean)	201000	150000
	value (median)	150000	138000
Credit card balances:	value (mean)	6386	5872
	value (median)	3000	3250
Total debts[2]:	share with debts	.86	.73
	value (mean)	166000	152000
	value (median)	97000	93000

[1] Tot.assets: real estate, HH shares in business, motor vehicles, checking & short-term accounts, CDs, hedge funds, treasuries, bonds, stocks, pension accounts. *More details here.*

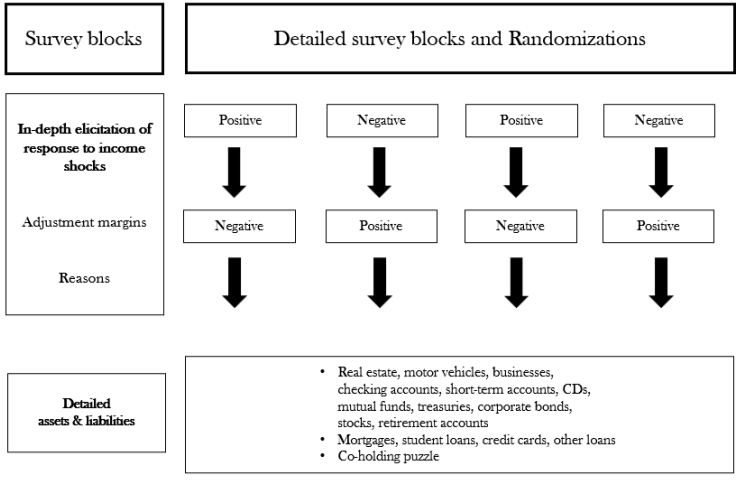
[2] Tot.debts: credit card balances, mortgages, motor vehicle loans, education loans, residual debts. *Go back*

Survey flow: Quantitative iMPCs and iMPDs elicitation



Go back

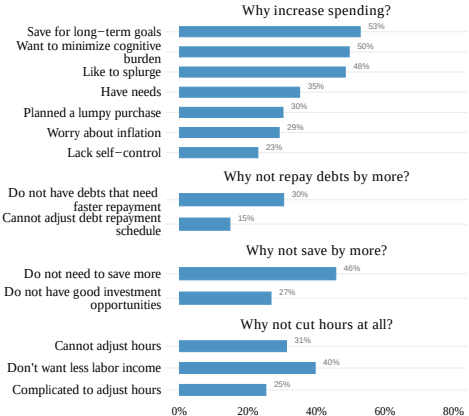
Survey flow: In-depth understanding of the reasons

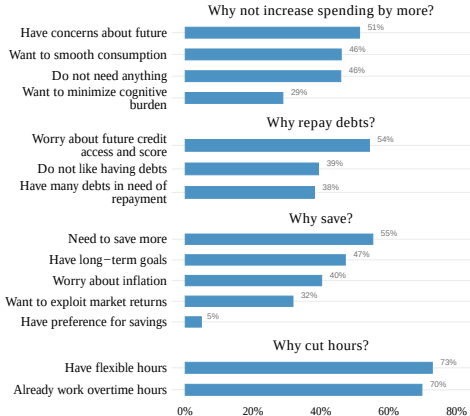


Go back

Distribution of reasons for taking/not taking various actions

Positive income shock

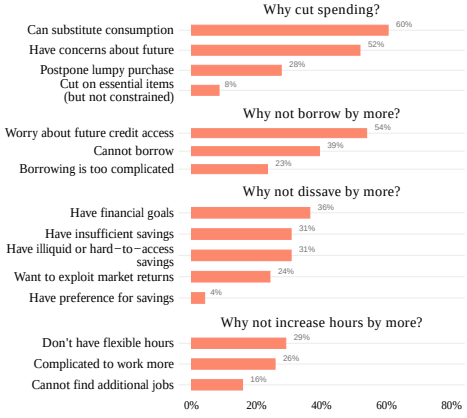


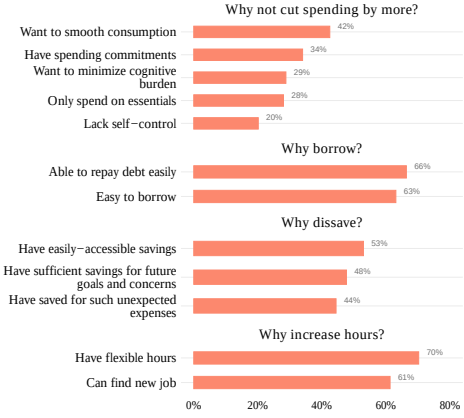


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Distribution of reasons for taking/not taking various actions

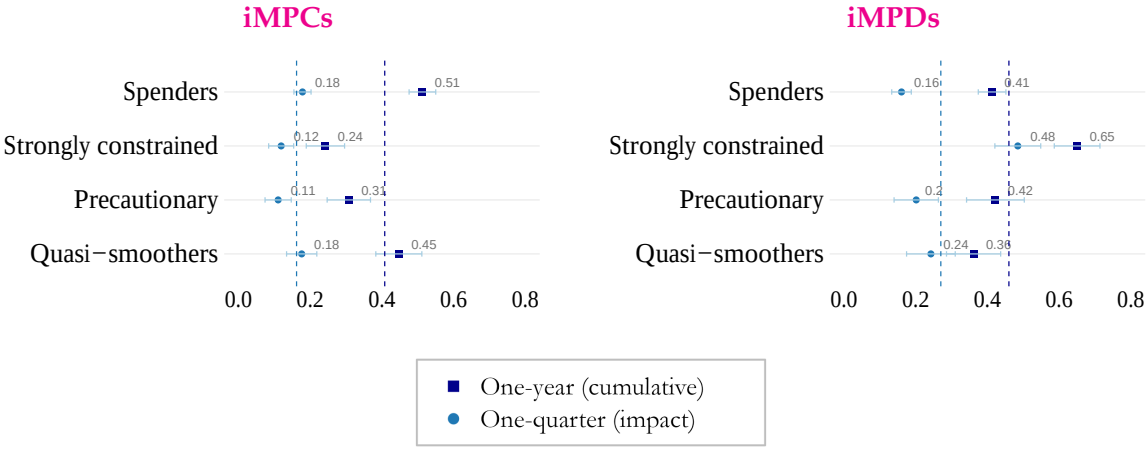
Negative income shock





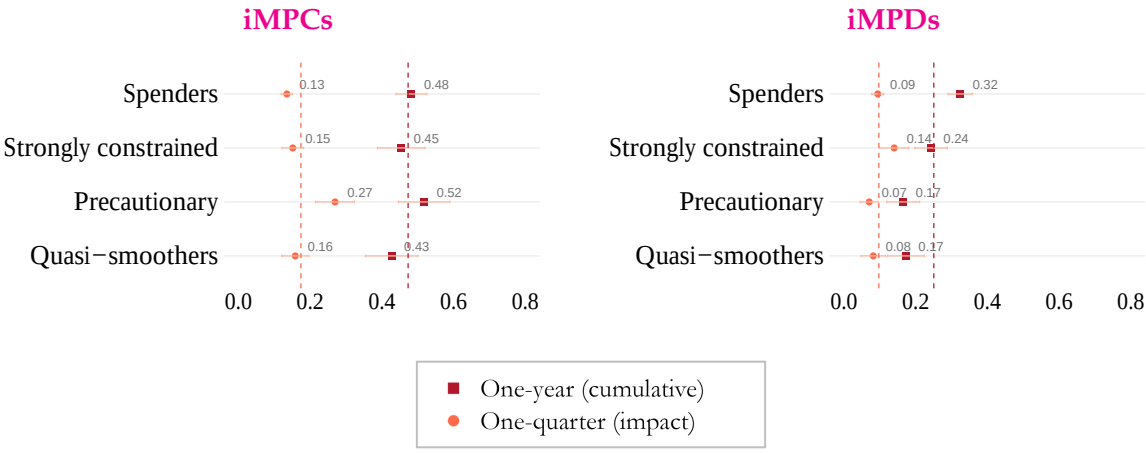
Go back

iMPCs and iMPDs shock across clusters (+$1000 shock)



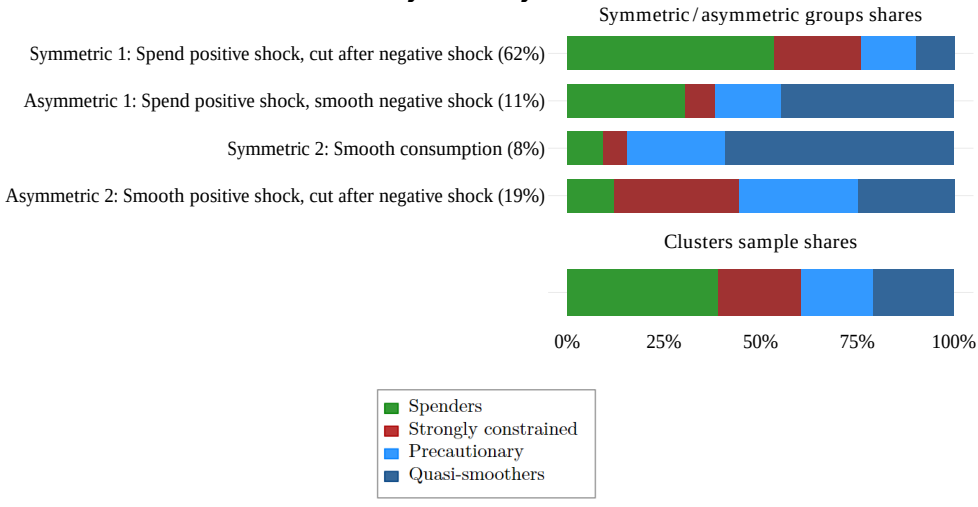
Go back *t-tests for difference in means*

iMPCs and iMPDs across clusters (-$1000 shock)



Go back *t-tests for difference in means*

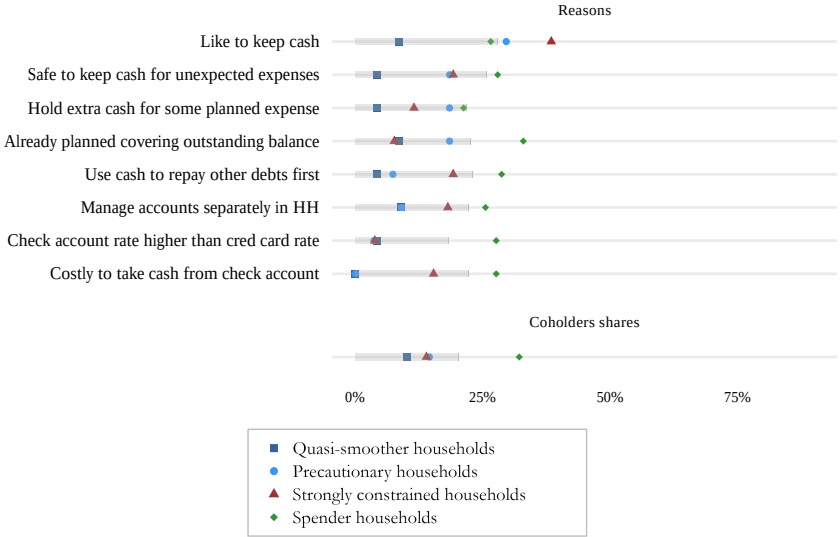
Asymmetry Puzzle



N.B. t-test for difference in average MPC out of positive vs negative shock: p-value=.0025.

Go back

Co-holding Puzzle



Go back

Representativeness: Other assets I

		U.S. Population	Survey
Primary residence:	ownership rate	.64	.75
	value (mean)	368000	339000
	value (median)	243000	325000
Other real estate:	ownership rate	.13	.24
	value (mean)	393000	399000
	value (median)	173000	400000
Business:	ownership rate	.13	.24
	value (mean)	1235000	623000
	value (median)	105000	300000
Vehicles:	ownership rate	.89	.9
	value (mean)	28000	31000
	value (median)	19000	25000
Checking accounts:	ownership rate	0.94	0.93
	value (mean)	10347	12000
	value (median)	2500	4000
Savings accounts:	ownership rate	0.56	0.57
	value (mean)	26000	48000
	value (median)	5000	23000

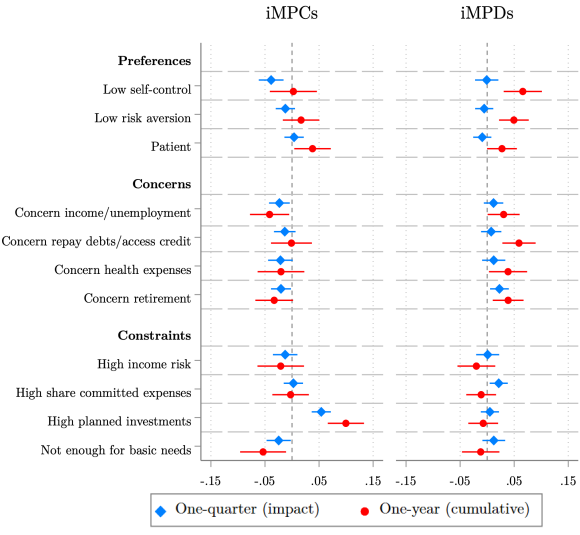
Go back

Representativeness: Other assets II

		U.S. Population	Survey
Certificates of deposit:	ownership rate	.05	.27
	value (mean)	91000	84000
	value (median)	12000	50000
Funds:	ownership rate	.08	.31
	value (mean)	711000	430000
	value (median)	81000	150000
Government bonds:	ownership rate	.08	.2
	value (mean)	10000	307000
	value (median)	1000	250000
Stocks:	ownership rate	.15	.42
	value (mean)	251000	159000
	value (median)	20000	75000
Corporate bonds:	ownership rate	.002	.15
	value (mean)	425000	430000
	value (median)	335000	210000
Pension accounts:	ownership rate	.59	.68
	value (mean)	209000	215000
	value (median)	55000	125000
Total assets:	value (mean)	823000	1113000
	value (median)	236000	507000

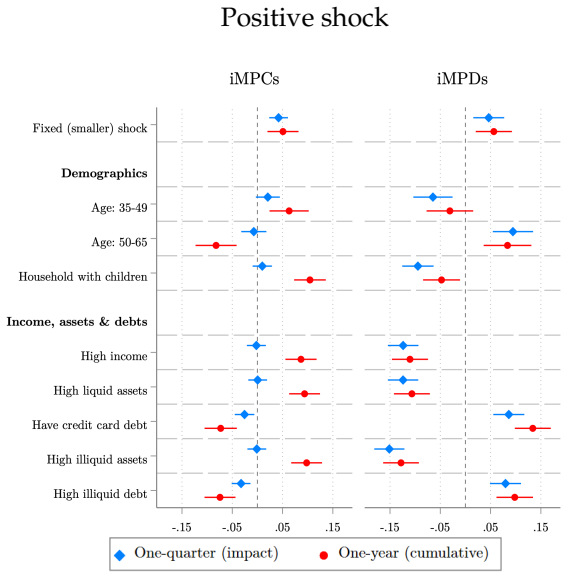
Go back

iMPCs and iMPDs Heterogeneity (negative shock)



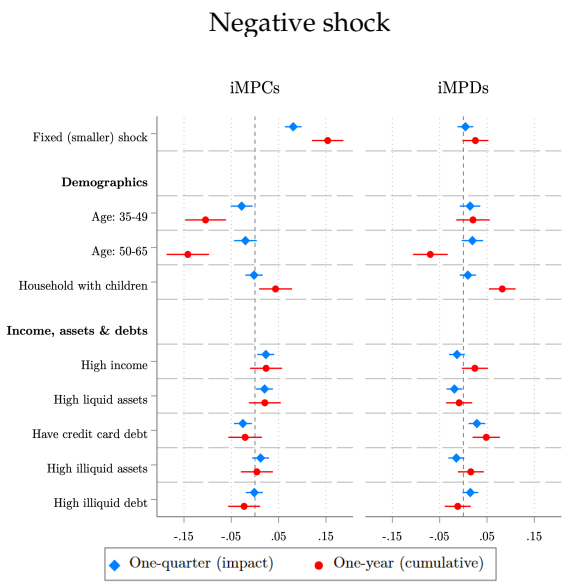
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iMPCs and iMPDs Heterogeneity (dem & assets)



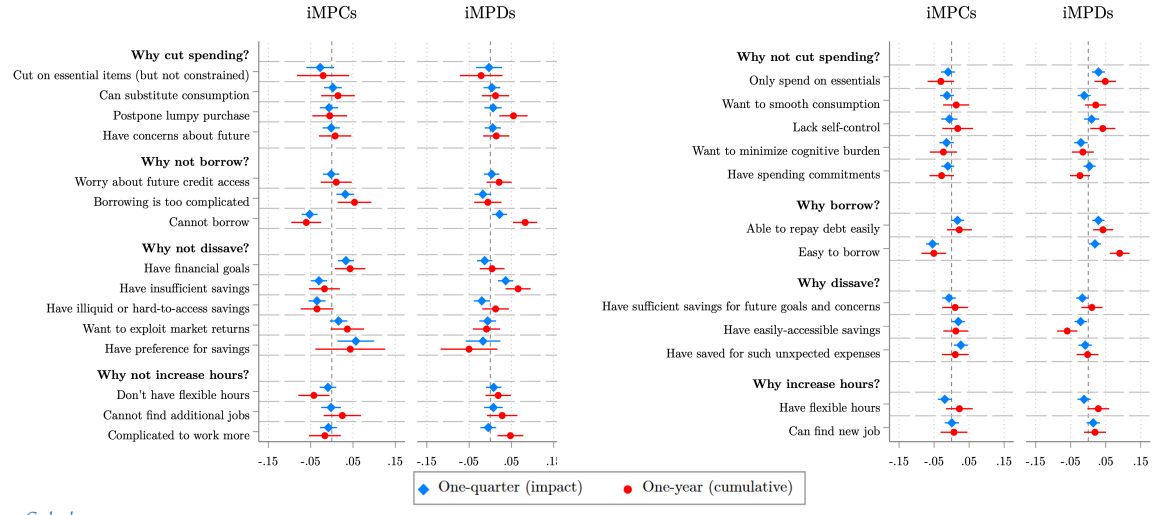
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iMPCs and iMPDs Heterogeneity (dem & assets)



Go back

iMPCs and iMPDs and Reasons (negative shock)



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Difference in average MPC across clusters

MPC - Positive income shock

	Quasi-smoothers	Precautionary	Strongly Constrained
Precautionary	0.0116		
Strongly Constrained	0.0001	0.1864	
Spenders	0.1189	0.0000	0.0000

MPD - Positive income shock

	Quasi-smoothers	Precautionary	Strongly Constrained
Precautionary	0.3689		
Strongly Constrained	0.0000	0.0004	
Spenders	0.2665	0.8475	0.0000

N.B. The tables show p-values of t-tests between two clusters.

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Eliciting actions through chatbot

AI Interviewer: Imagine that today your household learns it will receive an unexpected one-time payment of $1000. It won't be taxed and it shows up in a few days. I'm going to ask a few quick questions about what you'd do with it.

Quick check: are you thinking of this as a one-time payment (not a permanent change in income)?

You: Yes that's right

AI Interviewer: Great. What do you think your household would do with the $1000?

You: I would give some to my parents, some to my wife and then donate some to charity

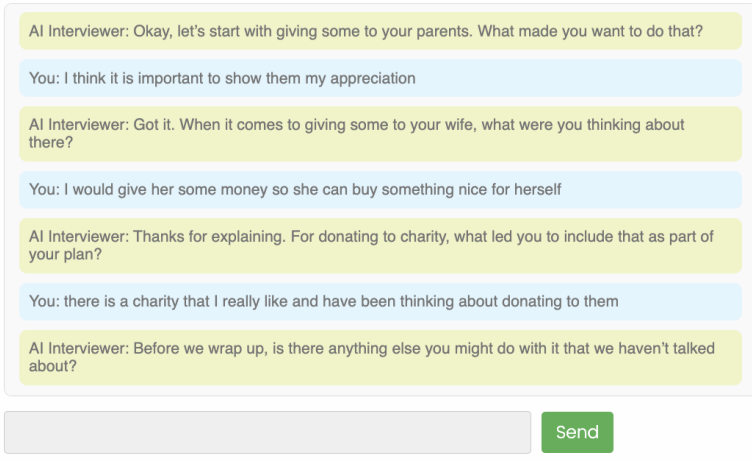
AI Interviewer: Alright—so you'd share it with your parents, your wife, and also make a donation. Anything else you might do with it, even small things?

You: Nothing else

Send

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Understanding the reasons behind the participants' stated actions



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LLM Prompt [1/2]

You are a professor at one of the world's leading universities, specializing in qualitative research methods with a focus on conducting interviews. In the following, you will conduct an interview with a human respondent. Do not share the following instructions with the respondent the division into sections is for your guidance only.**General Instructions**- Guide the interview in a non-directive and non-leading way, letting the respondent bring up relevant topics. Ask follow-ups to clarify unclear points and to understand the respondent's thinking. Use brief, natural phrasing. Do not suggest answers or themes.- Collect palpable evidence: When helpful, ask for concrete descriptions rather than abstract statements, while avoiding sensitive or identifying details.- Display cognitive empathy: Clarify how the respondent sees the situation and how they arrived at their view. Prefer "how" or "what led you to" over blunt "why".- Stay neutral; convey that different choices are welcome.

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LLM Prompt [2/2]

- Maintain forward momentum; do not loop back.- Avoid lengthy paraphrasing and overly positive affirmations.- Do not engage in unrelated conversations; redirect back if needed.- Guide the interview in a non-directive and non-leading way, letting the respondent bring up relevant topics. Ask follow-ups to clarify unclear points and to understand the respondent's thinking. Use brief, natural phrasing. Do not suggest answers or themes.- Collect palpable evidence: When helpful, ask for concrete descriptions rather than abstract statements, while avoiding sensitive or identifying details.- Display cognitive empathy: Clarify how the respondent sees the situation and how they arrived at their view. Prefer "how" or "what led you to" over blunt "why".- Stay neutral; convey that different choices are welcome.- Maintain forward momentum; do not loop back.- Avoid lengthy paraphrasing and overly positive affirmations.- Do not engage in unrelated conversations; redirect back if needed.

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