

Appendix A: Algorithmic Diagnostic Frameworks

Includes 3 frameworks that apply the literature discussed in the main article.

Micro-Analysis Summarised Tables:

Provides a granular, item-by-item diagnostic framework to evaluate construct validity, relevance, semantic framing, psychological safety, and cognitive flow.

Construct Validity & Relevance (1)		
Criteria	Diagnostic Question	Revision Strategy
Necessity	Is this question truly needed in this survey?	Remove the question entirely to reduce cognitive load.
Relevance	Does the question successfully ask the right question, and is it relevant to the actual subject of inquiry?	Rewrite the item to accurately match the specific target objective of the investigation.
Universal Assumptions	Does the question create or assume the presence of a variable across the entire population when it may only apply to a subset?	Rephrase to account for population variance and avoid universal generalizations.

Bias, Tone, & Semantic Framing (2)		
Criteria	Diagnostic Question	Revision Strategy
Leading Language	Is the language leading or presumptuous?	Unless strictly necessary for the design, use phrasing and language that does not lead the participant. Use neutral phrasing. This does not apply to hypothetical scenario based questions.
Neutral Attribution	Is the attribution of this question neutral and objective, while remaining humanistic?	Balance objective neutrality with humanistic empathy (e.g., adopting an empathetic observer stance).
Semantic Priming	Does the framing provide	Adjust the framing to

Bias, Tone, & Semantic Framing (2)		
	necessary context without biasing the respondent's answer (i.e., is semantic priming neutral and effective)?	provide bounded, exact context without acting as an aggressive suggestion.
Researcher Bias	Is researcher bias present, such that your hypothesis is assumed to be true without the presence of evidence?	Remove assumptions from the prompt and allow the respondent to state their own stance neutrally.
Justified Context	Is the language used in the question justified for this specific context?	Adjust vocabulary, tone, and reading level to match the target demographic and subject sensitivity.

Psychological Safety & Defensiveness (3)		
Criteria	Diagnostic Question	Revision Strategy
Confrontation	Does the question attack the respondent in any way, such that a reasonable person may take offense?	Soften the phrasing to create a psychologically safe environment instead of a direct interrogation. Use neutral language.
Evasive Options	Does the question allow the respondent to give a guarded/evasive response, or offer an escape?	Add an explicit opt-out (e.g., "Prefer not to say"), include more options, or provide open-text space for nuance. However, in some instances a forced-choice must be made, either by design or for the purposes of the investigation, and in such cases do not offer an evasive option, or favour open-text spaces.
Emotive Space	Does the question integrate emotive and/or permissive language to create space for honest, emotive views	Introduce an interpretive vacuum or use a permissive vignette that normalizes the behavior.

Psychological Safety & Defensiveness (3)		
	without biasing them?	
Epistemic Off-Ramps	If requiring an admission of error, does it effectively use an Epistemic Off-Ramp to offer a non-judgmental path to change stance?	Frame persuasion around changing context rather than past error, or use third-person projection (e.g., "Why might a reasonable person disagree?"). For more information refer to the Off-Ramp section.

Cognition, Structure, & Flow (4)		
Criteria	Diagnostic Question	Revision Strategy
Memory Retrieval	If the question involves memory retrieval, did you use Situational Anchors, deconstruct the timeline, and build a 'Cognitive Runway'?	Prime the brain with neutral facts first, provide exact bounded context, and use recognition milestones rather than pure recall.
Structural Integrity	Is this question double-barreled (asking two or more things simultaneously)?	Break the item into smaller, specific questions; if unavoidable, modify answer choices to include a paragraph-based answer.
Emotional Labor	Is the emotional labor of answering this question adequately compensated by the overarching incentive/reward?	Increase the incentive or reward to balance the psychological cost to the respondent.
Flow & Rapport	Is the question placed appropriately in the survey flow?	Move the item later/earlier in the instrument. It depends on the question where it is most appropriately placed. Questions that establish rapport are placed earlier, while demographic based questions are usually placed in the end. Move

Cognition, Structure, & Flow (4)

		questions with thematic links, or memory retrieval connections closer to each other.
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Consent Form and PIS Summarised Table:

Outlines the necessary architecture for the Participant Information Sheet (PIS) and consent mechanisms, ensuring ethical transparency, comprehension, respondent autonomy, and appropriate relational framing.

PIS & Consent Audit Framework		
Criteria	Diagnostic Question	Revision Strategy
Purpose & Scope	What is the purpose of the investigation?	Clearly state the primary objective right away; if it gets lost in complex academic language, refine it so participants instantly comprehend the exact reason for their involvement.
Purpose & Scope	What duration of time commitment is expected from the participant?	Communicate an authentic time commitment (e.g., 5-10 minutes) and avoid utilizing the low-ball technique to such an extreme that it compromises informed consent.
Purpose & Scope	Is the person reading this eligible for the investigation?	To avoid squandering a respondent's cognitive bandwidth, ensure that eligibility requirements and specific study boundaries are articulated with absolute clarity during the initial encounter.
Purpose & Scope	What is the nature of the questions the participant is expected to answer?	Provide advance notice regarding sensitive material to mitigate respondent discomfort and emotional strain throughout the survey experience.
Logistics	What happens if the participant participates?	Clearly outline the exact process they will undergo once they agree to start.
Logistics	What happens after the participant clicks submit?	Provide a clear explanation of how participant data is

PIS & Consent Audit Framework		
		processed following submission (such as through anonymized data pooling). The objective is to foster a sense of personal investment in the research outcomes and broader inquiry.
Ethics & Risk	What are the potential benefits of participation?	Transparently declare when direct benefits are absent, while clarifying how participant responses advance overarching societal or institutional knowledge. If rewards or prize drawings are provided, these details must be disclosed to respondents at this point.
Ethics & Risk	What are the potential harms of participation?	Rigorously assess potential emotional burden and psychological discomfort; maintain total transparency regarding risks while providing a clear rationale for them.
Authority & Trust	Who approved the ethics application for this survey?	Name the IRB or Ethics Committee to establish legitimate authority.
Authority & Trust	What organising body is responsible for the survey?	To build institutional trust, explicitly state the organization conducting the study; if no formal body is involved or if the research is privately run, clearly declare this condition.
Authority & Trust	Are there any conflicts of interest the participants may want to know about?	Transparently declare all institutional sponsorship and potential conflicts of interest at the outset; any perceived concealment

PIS & Consent Audit Framework		
		precipitates an immediate erosion of participant trust.
Data & Privacy	What measures are in place to protect the confidentiality and/or anonymity of the participant?	Communicate confidentiality assurances with transparent objectivity, yet refrain from exhaustive technical justifications that might inadvertently transform a trusting panel into a skeptical one.
Data & Privacy	How do the measures ensure the participant is protected?	Detail the safeguard methods in clear, straightforward terms, avoiding overly complex technical language.
Data & Privacy	Who has access to the data provided?	Explicitly state who will see the raw data (e.g., only the core research team).
Data & Privacy	How long is the data stored?	Provide the exact data retention schedule.
Data & Privacy	How will the participants' data be used?	Explain the end-goal (e.g., academic analysis, publication) so the respondent understands the final product.
Autonomy	Does the form inform the participant of the voluntary nature of their participation, and ability to resign from the investigation up to a certain point?	Explicitly state they are in control and can stop at any time before submitting.
Autonomy	Have you made it explicitly clear that the respondent can skip a question, refuse to answer, or exit the survey without penalty?	Provide clear assurances that skipping or exiting carries zero negative consequences.
Comprehension	Does the participant information sheet and consent form present	Evaluate readability using tools such as the Flesch-Kincaid scale,

PIS & Consent Audit Framework		
	information in a manner that is comprehensible by the participants?	removing unnecessary jargon to target an 8th-grade reading level. Note that a higher target level may be appropriate depending on the specific participant demographic.
Comprehension	Have you made your intentions as a researcher clear to your respondents, such that a person of reasonable capacity understands them?	Refine your research aims iteratively until their core intent is immediately transparent to any non-expert reader.
Comprehension	Is the inclusion of any further information for the participant to seek warranted?	Use a tiered "Read More" drop-down system for granular details to avoid wall-of-text fatigue.
Psychological Safety	Does the language used in the PIS and consent form successfully convince participants that the survey is a safe space for them?	Cultivate empathetic neutrality; ensure the tone is affirming and non-judgmental.
Relational Framing	Have you successfully framed yourself as a safe person who wants the respondent's voice to be heard?	Validate the user's specific perspective as crucial to the research without sounding patronizing.
Relational Framing	Have you reasonably convinced the respondent that you are not hostile towards them in any way, and that you can be trusted?	Eliminate any aggressive or presumptive language, adopting an objective observer stance.
Relational Framing	Have you reasonably convinced the respondent that you belong to their in-group, or framed yourself as a respectful, deeply curious outsider who recognizes their own limitations but genuinely	Avoid utilizing artificially manufactured affinity; instead, position the investigator as a respectful, deeply curious outsider who acknowledges their own limitations to foster authentic trust without

PIS & Consent Audit Framework		
	wants to learn and understand?	resorting to manipulative signaling.
Relational Framing	Have you reasonably convinced the respondent that you, nor any one reading their responses will judge them in any way for their answers?	Make a direct promise of non-judgment for their honest, unfiltered take.
Tone Calibration	Is the language in the survey informal to such a degree, that it could feel like a deep conversation between yourself and the respondent?	Balance the tone carefully; if it is too informal, the respondent may doubt your professional competence and data security.
Tone Calibration	Have you sufficiently stimulated/primed the average respondent to want to honestly discuss the content?	Use evocative, normalizing language to reduce defensiveness and invite candid reflection.
Support & Accountability	What is the contact information of the investigators and/or their supervisors?	Provide direct, working contact details for accountability.
Support & Accountability	Have you offered enough support resources to your respondents, such that they are able to get in touch with resources that can help them, relating to undue distress caused by the invasive nature of questioning?	Provide active helplines and explicitly normalize the potential for discomfort.
Consent Mechanics	Does the consent form truly need a signature, or will a checkbox suffice?	Use a checkbox; demanding a physical or digital signature depresses response rates and is unnecessary for online surveys.
Consent Mechanics	Does the consent form, not the PIS, include a short paragraph that conveys the	Strip away procedural friction and include a concise summary of

PIS & Consent Audit Framework		
	primary points?	purpose, risks, and voluntary nature right before the checkbox.

Macro-Analysis Summarised Table:

Offers an evaluative checklist covering the overarching ethical, structural, analytical, and logistical integrity of the entire survey architecture prior to deployment.

Macro-Analysis Framework: Ethical and Structural Survey Architecture		
Criteria	Diagnostic Question	Revision Strategy
Knowledge/Value Generation	Does the survey or investigation add new data or insights to an existing database, or generate new knowledge?	Question your motive or change the approach; ask yourself what you will actually do with this data. If a new investigation is not warranted, consider using pre-existing data.
Ethical Information	Have you given the participant all the necessary information to ethically conduct the investigation?	Ensure the PIS and consent materials cover all required disclosures.
Device Accessibility	Have you considered and/or used the possible devices a participant may use to answer the survey? Is the survey accessible and equally usable on multiple forms of devices?	If not equally usable, explicitly inform the participant beforehand so they know what to expect. Otherwise consider changing platform, modality, or formatting.
Target Demographic	Is your target demographic appropriate for this investigation? Did you consider sociodemographic, cultural, psychological, cognitive/physical accessibility, and intersectionality variables?	Modify the topic or demographic choices to ensure they align with an intersectional lens. And ensure that the survey is accessible and considers the entirety of the demographic.
Platform Security	Is the survey hosted on an appropriate platform that is secure, and is data stored on a secure server?	Move the survey to a compliant, secure hosting platform.
Question Flow	Does the order of the questions make logical	Reorder the questions so that they are thematically

Macro-Analysis Framework: Ethical and Structural Survey Architecture		
	sense?	linked or connected in a cohesive, easily navigable manner.
Respondent Commitment	Have you included a question at the very beginning of the survey to ask how the respondent plans to complete the survey?	Create a question that asks the respondent for explicit commitment to complete the survey.
Rapport Building	Have you placed safer questions before sensitive questions, far back enough so that you can establish rapport and trust and not incite defensiveness?	Sequence questions carefully, ensuring trust is built before probing into sensitive areas.
Qualitative Depth	Have you created space for long-form answers, or included questions that require long-form answers?	Consider integrating open-text fields to capture nuanced respondent projections.
Cognitive Load	Have you balanced deep text questions with low-friction multiple-choice questions to ease cognitive load?	Insert low-friction questions strategically to prevent survey fatigue.
Acquiescence Mitigation	Have you mitigated acquiescence bias by using balanced scales (positive- and negative-keyed items) or forced-choice formats where appropriate?	Restructure unipolar scales into balanced or forced-choice formats to detect and minimize meaningless agreement.
Survey Duration	Can the average respondent complete this in under 10-15 mins?	If no: Modify the PIS to inform the respondent or shorten the survey. If yes: Ensure the PIS notes the time commitment, consider suggesting a slightly lower expected time, and consider including a jolt question.
Post-Survey Support	Have you included support	Append relevant helplines,

Macro-Analysis Framework: Ethical and Structural Survey Architecture		
	resources at the end of the survey?	psychological resources, or contact information to assist distressed respondents.
Incentive Alignment	Is there sufficient incentive and/or reward for the respondent to want to discuss the sensitive topic?	Provide more incentive/reward for participation, but proceed with caution to avoid undue influence or coercion.
Grice's Maxims	Does the overall survey design and questions fulfill Grice's Maxims of communication?	Review and revise wording to ensure it is clear, relevant, and not misleading. Fulfilling the maxims of quantity, quality, manner, and relation.
Analytical Planning	Prior to actual data collection, did you plan out data analysis and tie specific research questions to the best of your ability?	Finalize your statistical strategy and create cross-links between your questions before deployment.
Demographic Anchors	Did you ask questions regarding demographic and behavior so that you have anchors for your data?	Include them at the end, though presenting them at the beginning is also an option.
Would You?	If you were a respondent, would you sit through the entire survey? (Ask peers or participants not directly affiliated with the design).	If no: Consider making sensitive portions optional, offer greater incentives/rewards, or improve persuasion in your PIS.
Tone Calibration	Is the language in your survey informal to such a degree that it could feel like a deep conversation between yourself and the respondent?	Ensure the conversational tone does not compromise the participant's perception of professional competence and data security.
Comprehension Level	Is the language easy to understand and follow at an 8th-grade or 6th-grade level?	Alter the language to be simpler and easier to follow. Though in some cases the language may need to be polysyllabic, or

Macro-Analysis Framework: Ethical and Structural Survey Architecture

		complex for a target demographic, as such this point primarily depends on the estimated reading level of the participant population.
Accessibility Baseline	Have you considered the worst-case situation for your possible participants, such that they too are able to participate in your investigation?	Consider these constraints in your design, modify as needed, and thoroughly test the instrument prior to dispatching it.
Environmental Context	Did you suggest the respondent be in your preferred environment to simulate more consistent data gathering, and ask the respondent where they are when they are taking the survey?	Consider adding instructions requesting a specific setting and an item capturing their current environment.
SDB Auditing	Did you consider the inclusion of a short SDB test in the design of the instrument?	Embed an SDB scale to check for and screen out response distortion.
Peer/AI Review	Did you discuss the final version with your team, colleagues, other researchers, or relevant people? (If using AI, were you mindful of sycophancy?)	Seek external feedback to spot blind spots, exercising high caution if relying on AI models for feedback.
Final Iteration	Once a final version is agreed upon, did you go through the framework once more?	Run the revised survey back through the checklist to ensure no new errors were introduced.

Hays et al. (1989): 5 item SDB measure

Listed below are a few statements about your relationships with others. How much is each statement TRUE or FALSE for you? (1 = Definitely False, 2 = Mostly False, 3 = Don't Know, 4 = Mostly True, 5 = Definitely True):

"I am always courteous, even to people who are disagreeable."

"There have been occasions when I took advantage of someone."

"I sometimes try to get even rather than forgive and forget."

"I sometimes feel resentful when I don't get my way."

"No matter who I'm talking to, I'm always a good listener."

Scoring

Dichotomous (Standard): 1 point is awarded for each response in the extreme socially desirable direction (e.g., "Definitely True" for item 1, "Definitely False" for item 2). Total score ranges from 0 to 5.

Continuous: Reverse-score items 2, 3, and 4, then sum all 5 responses (scores range from 5 to 25).

A higher score means SDB in that response is likely high. Do note that while counting reverse scored items, the 1 value scores 5, the 5 value scores a 1, the 2 value scores a 4, the 4 value scores a 2, and a 3 does not change. Therefore, scores higher than or equal to 15 are suspicious.

Example Question for Commitment:

To help us capture an accurate picture, which statement best describes the mindset you are bringing to these questions today?

I am ready to be completely candid and dive into the deeper open-text reflections.

I will answer as fully as I can, but I might keep my free-text answers brief.

I only have time for the quick multiple-choice options today.

Other:

