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Delphi Participant as an Ancestor: Introducing the Ubuntu Intergenerational Primer for Mitigating Future Discounting Bias in Southern Africa Collectivist Culture

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ABSTRACT

This paper introduces the Ubuntu Intergenerational Primer (UIP), a culturally grounded cognitive debiasing intervention designed to mitigate future discounting bias among Real-Time Delphi (RTD) participants in Southern Africa. Learning from prior research engagements and informed by the region's cultural settings, we innovated around the Rip Van Winkle (RVW) technique to produce a more contextually appropriate debiasing tool. In contrast to the RVW individualistic orientation, the UIP situates the Delphi participant within the collectivist Ubuntu-Intergenerational relationship. The tool positions a Delphi participant as an ancestor fielding questions about the future to a hypothetical future grandchild living in 2070. Implemented as a pre-survey cognitive priming exercise, the UIP preceded the main RTD survey that explored the futures of cultured meat in Southern Africa by 2070. The RTD data from 35 participants ($n = 35$) were analyzed through the Social Practice Theory (SPT) lens. The findings suggest that the UIP functioned as a cognitive scaffold that extended participant's temporal horizons and hence reduced future discounting bias. From the SPT perspective, the primer influenced the meanings associated with cultured meat more than the materials and competencies as enquiries on legacy, responsibility and obligations to future generations dominate. However, while the primer appeared to mitigate future discounting, it may also have simultaneously introduced kinship and legacy biases by directing focus towards imagined descendants. The study contributes methodologically to futures studies by demonstrating how culturally embedded intergenerational cognitive scaffolding deepens engagement with long-term futures, contextually to Southern Africa. Overall, the findings suggest that UIP offers a promising mechanism for enriching participatory foresight while recommending some further experimental validation.

1 | Introduction

The Delphi method is well known as a long-term forecasting and anticipatory tool (Calleo and Pilla 2023; Markmann et al. 2013; Rikkonen et al. 2019; Rowe and Wright 2011). Over the years, the method has evolved through technological integration from traditional iterative rounds to become web-based Real-Time Delphi (RTD) which optimizes participant interaction across geographically dispersed locations (Aengenheyster et al. 2017; Gordon and Pease 2006; Gordon and Pease 2006). However, despite the technical efficiencies, Delphi method remains susceptible to cognitive biases (Sokolov et al. 2025; Winkler and Moser 2016). Anticipating plural, long-term futures remains a cognitively demanding task often undertaken by participants from diverse professional and cultural backgrounds depending on the scale and focus of the study. Despite thorough participant selection and methodological rigor of Delphi method, future discounting

bias remains a challenge (Faiella and Corazza 2025; Winkler and Moser 2016; Yang et al. 2021). Futures discounting bias is the tendency to overvalue short-term benefits over long-term benefits (Bauer 2018; Doganova 2018). It is known with names such as presentist bias, temporal bias, delay discounting, future myopia or short-termism (Bauer 2018; Doganova 2018; Winkler and Moser 2016). In foresight science, it manifests as an overvaluation of immediate, proximate sociotechnical paradigms at the expense of distant systemic discontinuities. Schirrmeister et al. (2020) viewed it as a "presentist-trap" wherein the long-term imaginations are colonized by present practical realities which favors linear cognitive tendencies, incremental thinking, limited use of imagination, difficulty in imagining discontinuities, downplaying of weak signals, cultural inertia, silo mentality and over emphasis on current problems (Winkler and Moser 2016; Yang et al. 2021). As the temporal distance increases, future discounting also increases while the interests of future generations tend to receive progressively less consideration in decision making (Boston 2021; Casarejos and da Rocha 2019; Nakagawa et al. 2019; Saijo 2020, 2025). It is against this background that efforts are ongoing to identify cognitive and institutional approaches to tame future discounting bias.

While psychology and foresight literature established the ubiquity of future discounting bias (Faiella and Corazza 2025; Schirrmeister et al. 2020), this paper agrees and extends the notion that it's not merely an inherent human cognitive limitation but an epistemic lock-in perpetuated by disciplinary and professional training. Since Delphi panels deliberately assemble multidisciplinary panels (Devaney and Henchion 2018), for instance in the current study, economists, biotechnologists, health experts and social scientists inadvertently bring institutionalized cognitive frameworks, some of which reinforce future discounting. For example, economists and financial experts operate predominantly with principles such as Time Value of Money (TVM) which mathematically codifies the depreciation of the future relative to the present (Doganova 2018). While exceptionally correct in the finance context, it reinforces dispositions that discount the future which may subconsciously limit the expert's futures thinking outside their professional domain. Economists' overreliance on assumptions such as *ceteris paribus* (holding other things constant) give them false comfort and blind them to chaotic, intertwined, non-linear interactions of complex socio-technical systems. On the other hand, natural and applied scientists tend to heavily incline towards empirical data, positivist paradigms as well as cause and effect dynamics. Whilst scientifically apt, this onto-epistemic path-dependency inherently compromise cognitive abilities to make judgements about distant long-term futures under conditions of uncertainty, incomplete or non-existent information, which is ironically the essence of foresight-oriented Delphi method (Dalkey 2003; Afshari 2019; Fink-Hafner et al. 2019; Marchais-Roubelat and Roubelat 2011). So devastating is future discounting bias that it goes beyond impoverished foresight outcomes to influence cognitive frames that militate against implementation of long-term plans and blueprints (Black et al. 2024; Naseer et al. 2025).

Conscious of the problematic future discounting bias, foresight practitioners and cognitive scientists are increasingly experimenting with de-biasing interventions. These include experiential futures, role playing particularly inclusion of imaginary future generations, narrative scaffolding, future personas construction and Imaginative Mental Time Travel (MTT) (Fuchigami et al. 2025; Gauthier and van Wassenhove 2016; Hara et al. 2019, 2026; Knudsen et al. 2023; Milojević 2021; Topcu and Hirst 2022). Among the interventions is the Rip Van Winkle (RVW) technique which heavily informs the framing of Ubuntu-Integrational primer. Originally derived from the RAND Corporation's Assumption-Based Planning (ABP) and later picked for use in European foresight projects by Norbert Kolos of (4CF), the technique cognitively prime participants by asking them to imagine waking up decades in the future, prompting them to assess structural shifts retroactively rather than protectively (Dewar 2002). This interrogative approach serves to increase futures literacy, gather novel insights and open the cognitive space before further foresight interventions. By compelling participants to treat the futures as an opaque domain to be mapped through inquiry, the technique facilitates the identification of novel uncertainties thus cognitively debiasing them and inconspicuously challenging linear thinking patterns. Cognitive interventions have increasingly gained prominance in anticipatory governance. Most notably (Hara et al. 2019), introduced the Imaginery Future Generation (IFGs) demonstrating that introducing structured intergenerational accountability alter participant's ethical and cognitive posture towards the future.

In the Southern Africa context, the critical limitation of existing interventions is their reliance on individualistic, Western-centric cultural orientations. They assume a subject traveling through numerically calibrated time (e.g., 2026–2050), meeting and asking questions to anonymous future generations figures. These interventions may fail to smoothly align with the deeper Southern Africa cultural idioms, relational metaphors necessary to unlock a participant's imagination and let alone participant's motivation. Impersonal and unrelational futures offer a weak intrinsic motivation and cognitive engagement in the Ubuntu dominated Southern African collectivism (Poovan 2005; Molose 2018). As a humble attempt to narrow the gap, this study introduces a culturally grounded intervention, the Ubuntu-Intergenerational Primer (UIP) aimed at taming future discounting while promoting intergenerational responsibility. Our prior empirical engagements revealed symptoms of presentist bias among Southern Africa experts. For example, during mapping long-term impacts of cultured meat through the Futures Wheel, experts struggle to project beyond primary-level impacts to capture deeper secondary and tertiary systemic impacts. The observed patterns typify presentist bias or future discounting where short-term value of technological innovations is overestimated while long-term value is underestimated (Kanger and Schot 2019; Mokyr et al. 2015). Experts' comfort in discipline silos was noted through limited exploration beyond familiar boundaries. In another encounter, during the United Nations Framework Convention on Climate Change (UNFCCC) workshop held in Gaborone, Botswana under the NAP Expo 2022, local participants seem to struggle with RVW protocols. The same patterns were observed in Harare, Zimbabwe during the Futures week which was held in early 2023. Drawing lessons from the previous application of RVW in Southern Africa, this study introduces the Ubuntu-Intergenerational Primer, leveraging Ubuntu emphasis of interconnectedness, relationality and intergenerational responsibility.

To introduce and evaluate the analytical depth of this intervention, the study is guided by two primary research questions:

RQ1. *What culturally grounded cognitive primer can be used to reduce future discounting bias as Delphi participants evaluate the futures of cultured meat in Southern Africa?*

RQ2. *How do the exploratory questions generated by Delphi participants fare on the Social Practice Theory*, (*materials, competencies and meanings*), *and what does the distribution reveal about their underlying assumptions regarding cultured meat futures?*

The article is structured as follows: theoretical framework outlining Ubuntu and the Social Practice Theory (*SPT*), *methodology explaining how the UIP was conceptualized and deployed*, *presentation of participants enquiries to their future grandchildren*, *analysis*, *discussion and conclusion*.

2 | Theoretical Framework

2.1 | Philosophical Underpinnings of Ubuntu Intergenerational Primer

The UIP is grounded in Ubuntu, a culturally embedded philosophy that provides a relevant context for anticipatory thinking in Southern Africa. Ubuntu is commonly expressed through the maxims "*munhu munhu nekuda kwevanhu*" and "*umuntu ngumundu ngavantu*" in Shona and Xhosa languages respectively, emphasizing relational personhood, reciprocity and collective responsibility (Hoffmann and Metz 2017; Ramavhoya et al. 2025; Udah et al. 2025). Interpreting it from the cultural dimension lens, (Chenchieh Su 2022; Zheng et al. 2025), Ubuntu philosophy is fundamentally collectivist as it defines a person in relation to other people, promotes collective well beng, relationality and collective responsibility. Contrary to the narrow and potentially misleading understanding of Unhu//Ubuntu as a South Africa'sbelief, the philosophy has its historical and cultural roots among the Bantu speaking inhabitants of Africa. It is significantly recognized in countries such as Zimbabwe, Zambia, Malawi, Botswana, Eswatini, Lesotho, Mozambique, Namibia as a shared ethic that transcends national boundaries (Chigangaidze et al. 2022; Khazamula and Maluleka 2019; Madzore 2024; Mcallister 2009), even as far as Eastern-Southern African countries like Tanzania. Although Ubuntu is not explicitly a futures studies philosophy, it can be supportive to it through its relational ontology and intergenerational responsibility. Foresight is increasingly recognizing the importance of intergenerational responsibility in long-term thinking, but the methods and tactics are of the Global North orientation with the Japanese significantly contributing to the body of contemporary literature (Fuchigami et al. 2025; Hara et al. 2019, 2026; Nakagawa et al. 2019; Saijo 2020, 2025). Though these techniques appear to be universally applicable, they often resemble some contextual limitations. The Ubuntu Intergenerational Primer responds to the gap by drawing on to Southern Africa relational traditions to situate participants within a familiar cultural and moral frame before engaging in foresight work. The study demonstrates that local philosophies can enrich anticipatory practices (Sarpong et al. 2016), enhance participants' engagement and provide culturally meaningful pathways to desirable futures.

2.2 | Social Practice Theory (SPT)

The Social Practice Theory (SPT) is often applied in sociology and sustainability studies to explain how people everyday activities are shaped by social practices rather than individual choices (Shove et al. 2012). According to the SPT, social practices exist when three elements of materials, competencies and meanings are interconnected, established and shared in a society (Jabin and Atiqul Haq 2025; Shove et al. 2012). In a transition, these three elements are re-configured and solidified to form a new system (Shove et al. 2012; Welch 2016). The current research utilizes Social Practice Theory (SPT) to understand the Real-Time Delphi participants' assumptions about the long-term futures of cultured meat. Viewing participants' questions about the futures of meat through the SPT lens allows determination of whether participants anticipate alternative futures through fundamentally adjusted or transformed practices or if they exhibit cognitive linearity by projecting the same conventional meat practices. The basic assumption is that, the more participants shift from the static, presentists practices to dynamic and alternative future practices, the more successful the intergenerational priming intervention is deemed to be. The degree of alternative thinking could be loosely interpreted as evidence of debiased cognition against presentism among the RTD participants.

Basing on its core principles, SPT interlinks with the Ubuntu philosophy although they originated from totally different traditions. First, neither the SPT nor Ubuntu treat an individual as an autonomous decision maker. SPT argues that people carry the practices while Ubuntu suggests that people fully become human because of other people (Breems and College 2016; Mangena 2016; Shove et al. 2012). Therefore, both SPT and Ubuntu challenge the assumptions of some behavioral theorists that attempt to explain change through personal attitudes, rational choices and personal preferences. An example of such is Theory of Planned Behavior (TPB) (Ajzen 1991). The collectivist tone of SPT and Ubuntu gels well with the Ubuntu Intergenerational Primer ahead of individualistic approaches such as Mental Time Travel (MTT). Second, the SPT comprises of Meanings which include conventions, symbols and cultural understandings while Ubuntu provides a particular set of meanings rooted in collective responsibility, norms, respect and compassion (Shove et al. 2012; Udah et al. 2025). The interlinkages between SPT and Ubuntu justify the utilization of SPT as an analytical framework for this study ahead of conventional transitional theories such as the Multi-Level Perspectives, Transitional Management and Technology Innovation Systems.

The SPT has been increasingly applied in sustainability transition research (Laakso et al. 2024). It has been valuable in analyzing sustainability transition in sectors such as energy transition, e-mobility, health, agriculture, home appliances and sustainable consumption (Mesenhöller 2025). The current study applies the SPT to a futuristic bioeconomy, drawing from RTD participants enquiries to their hypothetical future grandchildren. Figure 1 illustrate how the tripod elements of SPT would look like under the cultured meat practice.

- **Materials** -These comprise of physical infrastructure, tangible physical entities, hardware, raw matter that enables the practice. For cultured meat transition materials could be Biotechno-equipment such as bioreactors, culture mediums, culture cells,

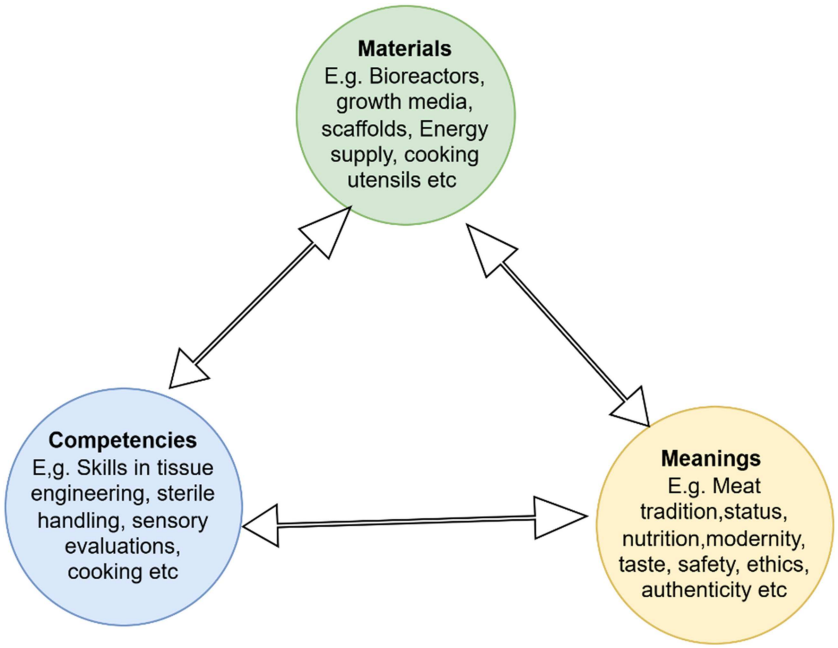

FIGURE 1 | Illustration of SPT elements for cultured meat. Source: Authors illustration informed by Social Practice Theory (Shove et al. 2012).

storage infrastructure, butcheries, cold room, packaging materials and so on.

- **Competencies** -These encompass skills, technical know-how, abilities and techniques used in the cultured meat value chains from raw materials extraction through bioreactors to forks. These include cell line selection, proliferation, scaffolding, structuring, harvesting, packaging, storing and cooking and so on.
- **Meanings**- These represent shared values, symbolic weights, worldviews, perceptions, attitudes, spirations, convictions, emotions and attachments embedded in a practice. For cultured meat these could include environmental meanings and symbols, cultural meanings, economic meanings, health meanings, technological meanings, status and political meanings within the fabric of Ubuntu philosophy.

By utilizing this comprehensive SPT framework, the study evaluates whether the UIP de-anchored RTD participants from their usually defensive near term and disciplinary silos to conceptualize a non-linear reconfiguration as an alternative future.

3 | Methodology

3.1 | Research Design and Researcher Positionality

This study adopts an interventionist approach (Fàbregues et al. 2023; Franco et al. 2021), where we introduce the Ubuntu Intergenerational Primer as a targeted methodological intervention to alleviate future discounting among RTD participant. Learning from RVW technique, the research took an adaptive approach by adjusting the technique for cultural relevance and practical utility. It also draws from the future generations' envoy (Hara et al. 2019) concept leveraging the grandchild as a highly valued future generation figure in Southern Africa cultural context.

The lead researcher is a Southern African scholar, shaped by the lived experiences of Ubuntu philosophy in the rural communities of Masvingo, Zimbabwe, some 25 kilometers from Great Zimbabwe monuments. His worldview is certainly grounded in Ubuntu and communal ways of knowing. Having lived in South Africa at some point, interacted with some communities in Botswana, Malawi and Lesotho, he possess foundational understanding of regional cultural logics. However, he remain cautious not to over-generalize his knowledge and experiences to the whole region, but his awareness is vital in reducing tensions between Western research protocols and indigenous practices. This position guided the framing of Ubuntu Intergenerational Primer and called us to continual reflexivity not to overextend our cultural assumptions in this research.

3.2 | The Rip Van Winkle (RVW) Technique and Its Contextual Limitations in Southern Africa

A summary of Rip Van Winkle narrative, a classic American folktale

This folktale by Wahington Irving is about a kind, but lazy and henpecked Dutch American villager whose name was Rip Van Winkle. He lived with his family during colonial America times. One day he escapes the scolding of his wife, Dame Van Winlke, by wandering into the nearby Catskill Mountains with his dog, Wolf. Lost in his wandering endeavor, he meets some men of Hendrick Hudson crew playing ninepins. The crew offered him a strong liquor, leading him into a deep sleep. Rip Van Winkle wakes up 20 years later, with foot-long beard, his gun rusty and his dog long gone. Upon returning to the village, he found his wife dead and so many changes which he couldn't

easily relate to. The village has grown into a bustling town. He missed the American revolution thus he is surprised to see King George III portrait replaced by President George Washington's portrait. The story has important takeaways on escapism, passage of time and change.

Adapted from Washington Irving 1819 (Bowler and Parminter 2016)

The Rip Van Winkle technique was originally developed by James A. Dewar at the RAND Corporation as a mechanism for identifying load-bearing and vulnerable assumptions in Assumption-Based Planning (Dewar 2002). The original protocol proposed by Dewar, relied on a narrative framing wherein a participant wakes-up after a long slumber (hence the technique's name, inspired by the protagonist of a short story by Washington Irving). Dewar's instructions were as follows;

> "You have been asleep for the last 20 years. You know nothing about the world in which you awaken. Somewhat unfairly, you have been asked to guess what your company operations are currently. To be somewhat fairer, before answering you are allowed to ask 10 questions about the world today. You are told that those questions must have yes or no answers and should not be contingent on the answers to other questions. What are your 10 yes/no questions?" (*Dewar 2002*)

While Dewar described the approach specifically with the Assumption-Based Planning framework, it was adapted by Norbert Kolos to function as a versatile foresight technique at the Futures Literacy Company (4CF). The adaptation evolved the technique from planning stress test into a de-anchoring protocol for conditioning foresight projects participants for long-term imagination. Little is available in white literature, but evidence of use is documented in grey literature (Figiel 2024; Sacio-Szymańska 2023). By cognitively pushing participants into an investigative and interrogative mindset, the technique shifts their cognitive focus from linear trends to mapping structural uncertainties by asking structured YES/NO questions (Dewar 2002, p. 79). Despite its utility, applying the RVW technique within Southern African context reveals some socio-cultural friction points:

1. Ontological conflation: The core metaphor of a prolonged deep sleep, typical of Rip Van Winkle 20-year sleep in the Catskill mountains (Bowler and Parminter 2016), is entangled with prominent religious and spiritual frameworks. This association risks coding of secular and simple foresight exercise as a spiritual encounter.
2. Individualistic isolation: The individualistic isolation in the narrative is detached from the regional cultural framework of collectivism rooted in Ubuntu.
3. Numeric temporal scale: Measuring time exclusively on dates for example, sleeping for 20 years or waking up in year 2050 or 2070 exacerbates temporal discounting. Distant years can be easily discounted due to lack of psychological and social proximity. Numeric temporal scales are too plain to evoke meaning cognitive depth and mental engagement.

3.3 | The Ubuntu Intergenerational Primer (UIP), Relationality and Time in Southern Africa

To resolve the identified friction points, we introduce the Ubuntu Intergenerational Primer (UIP). The adoption of psychology into futures studies is being explored to improve imagination and creative thinking of alternative futures (Faiella and Corazza 2025). Cognitive psychology views priming as an intervention where exposure to a specific stimulus activates representations, altering behavioral responses or processing styles (O'sullivan and Schofield 2019; Wang et al. 2023). Within the foresight methodology, priming can act as a path to debiasing by using role plays or future personas (Lim et al. 2026; Rodela et al. 2025). The UIP introduces such role play in form of a hypothetical grandchild, a relational figure that is highly regarded in the socio-cultural context in Southern Africa. The grandchild represents the cultural and psychological aspects of Ubuntu values such as, relationality *(ukama)*, identity "we," responsibility and custodial care (Breems and College 2016). Grandchild also brings in the generational timescale which substitutes the abstract time metric for example, 2070 can be substituted by two generations between now (2026) and then. In Southern Africa, a grandchild is traditional time marker, who represents passage of a long time and generational change (Schrijner and Smits 2017). In this sense, a grandchild acts as a cognitive scaffold that helps participant's mind to transcend present realities and engage more deeply with distant futures. The presence of an imaginative close relative in that distant future humanizes an otherwise abstract long-time horizon while also motivating the participant.

3.3.1 | *The Imaginary Grandchild (*muzukuru/umuzukulu*)*

In Southern Africa, a grandchild stands as a powerful embodiment of the future, a living proof of unfolding future generations (see Table 1 for grandchild's name in native languages). Fortunately, in Southern Africa, due to totems and extended family relationship, a grandchild is guaranteed to everyone whether as a direct biological descendant or otherwise. The grandparent/ancestor and grandchild bond is traditionally strong and symbolic. Traditionally, both cherish their appointed teaching and learning time on fireside folktales (*ngano, izindaba, instomi*), which offered opportunities for knowledge transfer, transactional learning and transformative learning (Mutasa and Mapara 2008; Netshandama and Nevhudoli 2021). It is upon this pre-existing social learning platform and cultural framing of loyalty and trustworthiness that we seek to anchor the Ubuntu Intergenerational Primer.

As notable in the rhyming of names across countries, so is the cultural significance of the grandchild. The UIP leverages the kinship bond, which embodies the social, emotional and moral ties between the Participant (ancestor) and Informant (grandchild). The RTD participants were morally engaged and intrinsically motivated to engage in research that involve their grandchildren (Figure 2).

TABLE 1 | Native grandchild names in selected Southern Africa countries.

Country	Selected Native Language	Grandchild native name
Zimbabwe	Shona	Muzukuru
	Ndebele	Umzukulu
South Africa	isiZulu	Umzukulu
	isiXhosa	Umzukulu
	Tshivenda	Mudzukulu
	XiTsonga	Mudzukulu
Eswatini	siSwati	Umzukulu
Lesotho	Sesotho	Setlogolo
Botswana	Setwana	Setlogolo
Zambia	Bemba	Umwipa
	Chewa	Mwana wa mwana
Malawi	Chewa and Tumbuka	Mwana wa mwana
Tanzania	Swahili	Mjukuu
Mozambique	Changana	Mudzukulu
	Makhuwa	N'mwana wa mwana
Democratic Republic of Congo	Lingala andTshiluba	Mwana wa mwana
	Swahili	Mjukuu
Namibia	Otjiherero	Omuzukuru
Angola	Umbundu	Omwana wa mwana

3.3.2 | *Outlining Ubuntu Integrational Primer*

The adjustment of RVW techniques to accommodate Ubuntu, relationality and generational time creates a distinctive and culturally grounded primer which we termed the UIP. Refer to Table 2 for the differences between RVW technique and UIP.

3.3.3 | *Comparing the Rip Van Winkle Technique with Ubuntu Intergenerational Primer*

3.4 | Operationalizing the UIP in the Real-Time Delphi Study

The study incorporated UIP as a mandatory pre-survey undertaken by all participants. Participants were instructed to ask three (3) questions about cultured meat to their future grandchildren (or great-grandchildren) living in 2070. Our RTD study ran on the Futures Literacy Company's premium 4CF Halynx 2.0 Real-Time Delphi software. Theparticipant could ask from any topic such as technology, economics, culture regardless of their specialisation but the questions should be answerable with a YES or a NO. The bracketing technique allowed participants to field questions without being restricted by researchers' pre-coding biases (Thomas and Sohn 2023) or their own fields of specialization. For example, a Biotechnology expert could field questions related to cultural or economic assumptions if they value such a topic. This bracketing approach freed participants to provide top of mind questions about cultured meat in 2070, thus reducing researcher induced bias associated with pre-coding. Unlike the actual Delphi questions, the pre-survey questions were neither available to iteration (they were once off) nor accessible to co-participants in the panel (they were confidential). Therefore, the questions to the future grandchild were standalone, ad hoc and confidential. The questions were mandatory, that is, no expert could proceed with the main Real-Time Delphi (RTD) questions without taking on the pre-survey. However, the pre survey was only available at first entry, returning to RTD for iterations did not require this exercise.

3.5 | Data Analysis Plan

Analyzing the participants' questions through (Shove et al. 2012) triad of Social Practice Theory tests their assumptions regarding a potential socio-technical transition over the 45-year horizon (2025–2070). The distribution of participants' questions across the three elements of materials, competencies and meanings indicates what they value the most, especially considering that asking was without rigid pre-coding. The resultant data patterns were interpreted as following:

- Materials: A dominance of materials-focused questions on cultured meat indicates that participants assume localized production of cultured meat within the region. For example, if questions include bioreactors, cultured meat butcheries, cell cultures and related physical properties. Conversely, a scarcity of materials related questions indicates imagination of consumptive transition subject to consistency with responses on meaning and competencies. Dominance of materials related to conventional meat such as cattle ranches denotes linearity or failed transition to cultured meat.
- Competencies: A dominance of questions revealing human capital skills set shift towards cultured meat denote perceived assumptions of transition. For example, inquiries on culturing techniques and cultured meat cooking techniques could be linked to imaginations of transitioned meat industry. Scarcity of such questions signify otherwise, especially if coupled with conventional meat value chain competencies.
- Meanings: Reproduction of the existing meanings denotes linearity in participants' questions, signifying stability and continuity of the traditional meat regime while modified meaning signify assumptions of transitioned meat industry. Contested meaning acknowledges tensions between current realities and perceived future obligations

By analyzing bracketed and uncoded questions, the SPT framework bypasses the standard analytical filters that inhibit a transparent look at whether the primer triggered alternative long-term thinking or perpetuated linearity.

4 | Results

Thirty-five (35) participants from 10 countries successfully completed the UIP pre-survey, yielding 105 questions. Of these

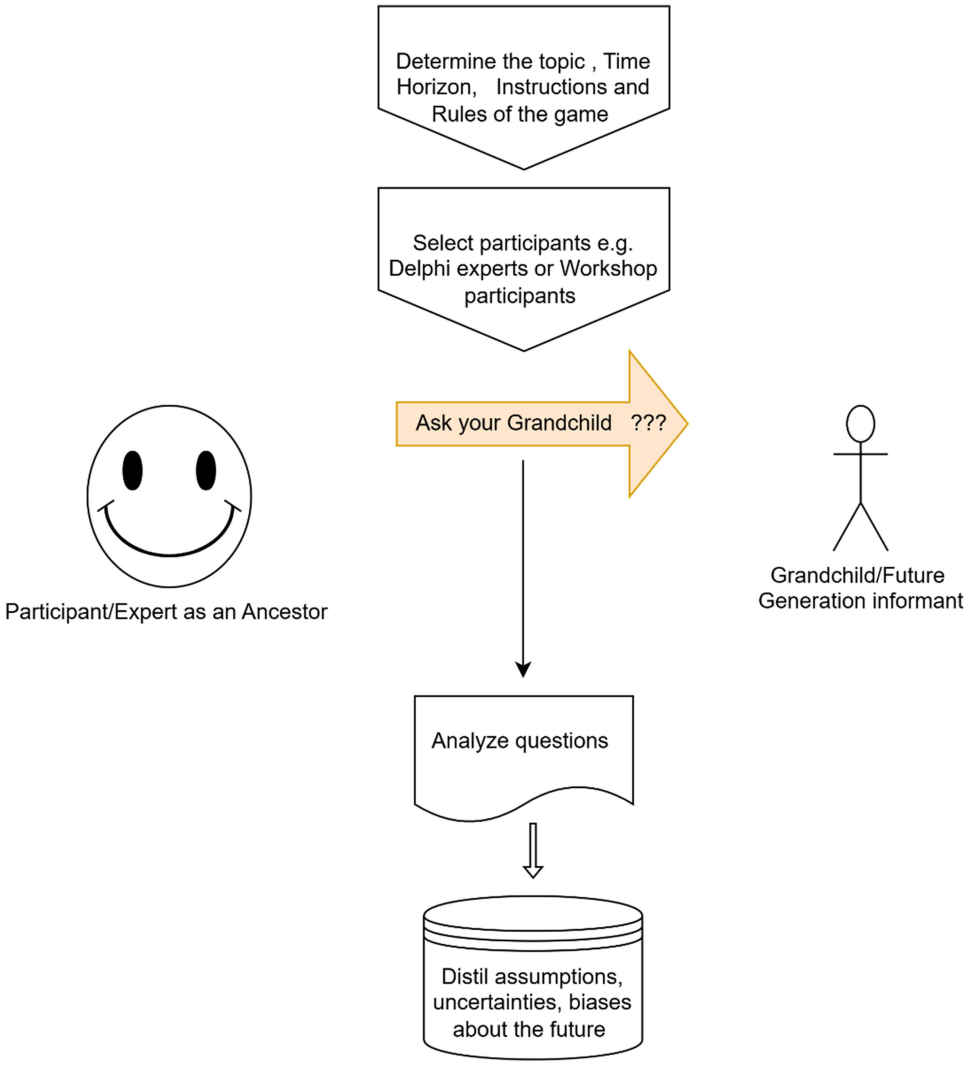

FIGURE 2 | Ubuntu intergénérationnel primer. *Source:* Authors' illustration 2026.

TABLE 2 | Rip Van Winkle technique versus Ubuntu Intergenerational Primer.

Feature	Rip Van Winkle (RVW)	Ubuntu Intergenerational Primer (UIP)
Core metaphor	Hypothetical deep sleep, waking up in an unfamiliar future	Mental dialogue with a hypothetical descendant that is, grandchild
Temporal metric	Abstract numeric timelines for example, 20 years or year 2050	Generational markers for example, two generations into the future used along with numeric timelines
Cultural alignment	Individualistic orientation, solitary mental time travel	Collectivist orientation, relational time travel, discussing within an important relative.
Affective resonance	Minimum moral and emotional attachment to the targeted horizon	Deep moral, emotional and custodial accountability and responsibility.
Reflexive depth	Primarily operational based on identifying changes	Deeply normative, encourage moral reflection

questions, 26 were removed as they could not fit the YES/NO criteria. We remained with 79 questions which are displayed in Table 3. Classification of these questions was done manually through the Social Practice Theory lenses namely the materials, competencies and meanings. The manual tallies were cross referenced by classifications generated by AI Gemini (thinking version) which gave almost the same classification. Each participant posed three questions separately; thus, questions are presented in three different sets (see Table 3 and presentation on Figure 3).

5 | Analyzing the UIP Results

We applied the Social Practice Theory (SPT) as an interpretive lens (Svennevik 2022). Examining the participants' questions

TABLE 3 | Participants' questions on cultured meat to their grandchildren living in 2070.

Presentation and coding of Participant questions using SPT lenses
First Set of Questions
Is a meal with meat still the most loved meal of the day? MN
Is meat still part of the diet? MN
Do you prefer cultured meat to traditional unprocessed meat? MT + MN
Is cultured meat home grown? C + MT
Is meat originally made from real animals? MT
Is meat still considered an essential part of family meals in your country? MN
Are people still eating meat? MN
Should we make a family braai mandatory once every week? MN + C
Are you still celebrating Christmas in the village by slaughtering an entire cow as a family? MN + C
Is beef still the most widely consumed type of meat in Zimbabwe? MT + MN
Is meat still coming from livestock for example, chicken or you are now using technological advanced technology? MT
Is the quality of the cultured meat good? MT + MN
Is meat as a relish still an important part of your supper meals? MN
Do you have authentic meat products in the butchery's? MT
Do you know Botswana used to produce the best beef? MN
Do people in your time mostly eat cultured meat instead of farm-raised meat? MN
Is the cultured meat you buy at your local butcher fresh meat? MT
Is the meat still tasty? MN
In 2070, is beef still the most commonly eaten type of meat in Lesotho? MN
Do you frequently eat red meat at your home? MN
Has cultured meat been accepted by the majority of people living in 2070? MN
Is meat a very important part of your staple food? MN
Do you like cultured meat? MN
Are meat companies Zambeef and Kachema still selling grass-fed beef in Zambia? MT
Is eating meat considered a luxury rather than everyday food? MN
Is cultured meat served more than once a week for school lunch? MN + MT
Do you like cultured meat? MN
Is going out to braai as a family still an important aspect of your life MN + C
Do you slaughter animals for traditional ceremonies? MN + C
Is meat still the most important protein source in your country? MN
Second Set of Questions
Do you eat meat every day? MN
Is African beef still the best meat? MN
Do you mind if the meat you eat is not naturally made? MN
Could you still buy meat in a regular supermarket that wasn't from a plant? MT
Is lab-grown or artificial meat more popular than traditionally farmed meat in your community MN + MT
Are there artificial meat farms now common in the City Industrial areas? MT
Is a butchery within a distance of 3 km from your home? MT
Is meat still being graded with some grades being too expensive to buy? MT
Is goat meat commonly eaten in rural areas of Zimbabwe? MN + MT
Is it cultured meat healthy? MN
Are the prices of cultured meat per kg reasonable? MN + MT
Is the traditional meat animal farmer a common figure in your place? (Yes/No) MT
Are butcheries in your city up to clean standards? MT
Have you been to a ranch before? MT
How do people today (2070) view eating conventional animal meat — is it rare, nostalgic, taboo, or banned? MN
Is sharing a plant-based meal more common than sharing a meat-based meal at family gatherings? MN
Do you really prefer the meat that is made at home over the meat bought from the butcher? MT
Is chicken more affordable than other types of cultured meat in your country? (Yes/No) MN + MT
Do your family members in their 30s and above prefer eating cultured meat in their daily meals versus other relish provisions? MN
Is cultured meat free from any side effects for the people who consume it? MN
Is the meat or its products still source of important elements your body needs? MT
Do you like cultured meat stewed or roasted? C
Do you still have Mika meats outlets in the compounds (Yes/No) MT
Is most of the meat you eat now plant-based or lab-grown instead of from animals? MN + MT
Do you still raise animals for food? MT + C
Third Set of Questions
Is (conventional) meat still expensive? MN
Is (conventional) meat still a leading cause of many chronic diseases? MN
Have you ever eaten lab processed meat? MN + C
Is most of the meat people eat real animal muscle, not grown in a lab? MN
Do most households rely on plant-based proteins as their main source of nutrition instead of meat? MN
Is there reduction in prevalence of meat related diseases? MN

(Continues)

(Continues)

TABLE 3 | (Continued)

Presentation and coding of Participant questions using SPT lenses
Is meat generally affordable to all in your area of residence? MN
When meat is limited in the home, does the father still get many pieces when kids get soup? MN
Are there government regulations that control the sale of cultured meat? O + MN
Do you still get together for family meat occasions? MN
How easily accessible is the cultured meat? MN + MT
Is home cooked food a usual concept for your supper meals? (Yes/No) C
Is the cultured meat you buy always fresh? MT
Do butcheries still sell different types of beef cuts? MT
Did cultural or religious traditions adapt easily to lab-grown meat? MN + C
Is there tensions between cultural and religious traditions on lab-grown meat? MN + C
Do traditional dishes from our culture still include meat as a main ingredient? MN
Can there be a celebration without meat? MN + C
Do you still have popular cuts of meat? MT
Are traditional meat dishes such as braii/gochi-gochi still an important part of family gathering? MN + C
Do you easily access cultured meat in your area? MT
Do you still have beef sections in chain stores like Shoprite and Pick N Pay in South Africa? MT
Has Zimbabwe managed to make meat affordable for everyone? MN
Is cultured meat the main source of protein your protein? MN + MT

Abbreviations: C, Competencies; MN, Meanings; MT, Materials.

across the materials, competencies and meaning layers of the SPT reveals some cognitive shifts that can loosely be classified as evidence of debiasing.

5.1 | Cultural Anchors, Modified Meanings and Ritualistic Decoupling

As illustrated in Table 3, the Meanings element commanded most of the questions fielded to the 2070 grandchildren, accounting for 54.4%. The distribution represents a departure from a typical technological forecasting pattern. Given that the participants panel was heavily tilted towards professions in natural and applied sciences including biotechnology, food science, energy and health, the standard domain heuristics would favor an overwhelming bias towards technical inquiries (materials element). The dominance of Meanings-based questions confirms that meat cannot be evaluated as a mere food or commodity but rather as a culturally embedded symbol (Soyombo et al. 2024). Unlike in our previous engagements, the RTD participants moved past the narrow disciplinary boundaries to interrogate the complex socio-cultural dimensions of cultured meat transition. An excellent exemplary question is: *Do you still slaughter live animals during traditional ceremonies?* This question directly inquire about the potential decoupling between the act of slaughtering animals and social or spiritual legitimacy of traditional ceremonies. The participant is trying to understand whether the relational link between animal slaughtering and legitimacy of a traditional ceremony persists or if it has collapsed with the cultured meat transition. Some participants used the primer to explore very critical uncertainties and potential power struggles that could be associated with cultured meat transition. Most importantly, these questions were framed in a post-hoc manner, asked in retrospective framing rather than presentist one. A good example of

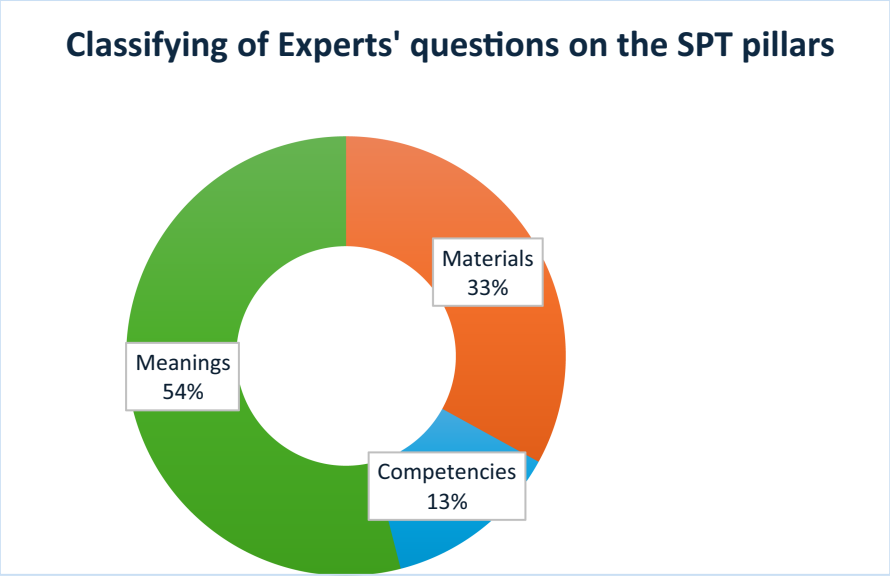

FIGURE 3 | Classifying experts questions on SPT. *Source:* Research data.

such questions is this one: *"Did culture and religion adapt easily to cultured meat?"* By framing the question in ad hoc manner, it appears they have projected their consciousness past the immediate realities of conventional meat dominance and now looking back from a different vintage point in 2070. The retrospective framing is what the UIP was aiming for to break participants free from the obscuring near-term thinking frames.

Uniquely to this study and typically to the Southern African Ubuntu philosophy, participants were concerned with continuity of meat symbolic cultural and relational functions. Questions concerning collective braais, Christimas slaughters, traditional ceremonies, village gatherings and family meals indicate that meat is being conceptualized as a cultural practice embedded within kinship (ukama), identity and belonging. According to the SPT, practices endure when their meanings remain socially relevant (Shove et al. 2012). Participants appear to be more concerned with the preservation of social worlds that meat helps to produce than how meat is obtained. This finding is fundamentally important because it challenges the dominant technocentric narratives that concentrate on technical efficiency and price parity (Lanzoni et al. 2022; Stephens et al. 2018). In socio-technical transition discourse, cultured meat is mainly framed as a disruptive technology capable of transforming food systems (Valencia et al. 2022), yet dominant meanings future logic here questions whether social worlds created by meat will be preserved under the post-livestock meat economy.

5.2 | Prospecting the Reconfiguration of Conventional Meat Regime

Questions targeting the Materials element comprised 26% of the generated data. Materials such as bioprocessing plants are requisites for the supply of cultured meat (Eduardo et al. 2026; Wu et al. 2025) Participants posed questions that implied an imagination of a possible reconfiguration of material conditions around production, preservation, distribution, preparation and consumption of cultured meat. Without delving into the desirability of such imaginations, we observed that participants spared the thought of an alternative imagination beyond the present meat regime. This is evident in highly structured questions such as: *"Are artificial meat factories now comon in your industrial areas?*" and "*Could you still buy meat in regular local butchery?*" These questions signal a shift away from present-day livestock infrastructure, ranches, feedlots and rural to urban supply chains. The capacity of participants to generate these specific localized queries suggests that UIP allowed them to temporarily suspend their common institutional ontologies to imagine different settings. However, inquiries on Materials-related questions were scarce as compared to meanings suggesting imaginations of a consumptive transition (Greene 2018), as opposed to that dominated with cultured meat production. This finding has implications on economics and trade patterns associated with such a social practice.

5.3 | Radical Skills and Domestic Bioprocessing

The remaining 19% of questions focused on the Competencies mapping how human skills,know-how and operational rules are required to sustain a cellular agriculture based new system. One examplary question in this category was framed as: "*Is cultured meat now home grown*." The question carries a double-barreled implication based on how the boundary of home is constructed, but either way it shows the assumptions of a transitioned meat value chain. At macro-level it can be interpreted as referring to the availability of skills to locally produce cultured meat within the region or a country. On the micro level, it can be understood as asking if cell cultivation has become an everyday kitchen skill using home hold appliances. Either way, the assumption of a radical human capability remains firm because the present domestic competencies in Southern Africa revolves around livestock husbandry, self-rearing of animals, slaughtering and conventional meat processing. By conceptualizing a future where ordinary citizens possess bioprocessing skills, the participants demonstrate a clear cognitive leap due to UIP. However, the general scarcity of competencies questions cast doubts on assumptions of purely transformative transition as most competencies' inquiries remain largely tied to familiar practices such as cooking, roasting, sharing, purchasing and consuming. Consequently, the envisioned future lacks evidence of profound re-skilling that typically accompany socio-technical transformation.

6 | Discussion

The empirical findings generated by the UIP reveal a shift in how experts conceptualize the possible future meat industry. The dominance of the Meanings-based questions (54%) demonstrates that the primer successfully shifted the panel's core assumptions underlying the cultured meat innovation far more deeply to cultural meanings than as a mere biotechnology or agriculture commodity. Though the findings align with the contemporary literature positioning socio-cultural factors as significant in the novel food transitions (Abbasi 2024; Britwum and Demont 2022; Kombolo Ngah et al. 2023; Laureati et al. 2024; Lewisch and Riefler 2023), there are notable new discussion points. Spontaneous mentioning of cultural factors such as traditional rituals and cultural practices shows how food and culture are intertwined (Soyombo et al. 2024).

6.1 | UIP Questions in the Context of Global Narratives on Cultured Meat

6.1.1 | Emergence of Heritage Preservation Narrative

Whilst the dominant narratives are framed around sustainability, food security and animal welfare and technological innovation, the intergenerational questions raised by Delphi participants revealed distinct concern for preservation of cultural practices around the 'meanings' ofmeat. It is not merely about how meat is obtained, but whether the social meanings, cultural values and practices associated with meat consumption are maintened. Participants repeatedly questioned whether future generations would continue to participate in family braais, traditional ceremonies and other communal practices that promote togetherness, suggesting that meat is not a mere source of nutrition but a cultural artifact (Tobias-Mamina et al. 2025) that is embedded in kinship, belonging and intergenerational continuity. From a futures study's perspectives, the finding reflects a persistence of deeper cultural metaphors and

narratives that shape collective assumptions and imaginaries (Inayatullah 1998), of desirable meat futures in Southern Africa. Participants burst out of their professional silos to dwell on cultural meanings of meat. This signify that the legitimacy of cultured meat in Southern Africa may depend less on environment, economic or technological performance but on its ability to reproduce or adapt to the social and symbolic functions that are currently performed by conventional meat. The Technology Innovation System (TIS) places legitimacy as one of the pillars of successful socio-technical transition (Gonera et al. 2023; Köhler et al. 2019; Tumilowicz et al. 2019). Thus, the legitimation of cultured meat in Southern Africa is likely to be centred on cultural aspects than the sustainability narratives which are dominant in the contemporary literature. The emergency of heritage preservation narrative therefore presents an original contribution, highlighting a deep cultural dimension of meat futures that is valuable in the Southern Africa context.

6.1.2 | *Participants Overlooked the Climate Change and Sustainability Narratives*

The participants surprisingly overlooked the globally acknowledged drivers of cultured meat revolution particularly climate change and sustainability challenges (Crawshaw and Piazza 2023; Davis et al. 2024; Fujiwara and Tachikawa 2024; Hocquette et al. 2024; Sobratee et al. 2022). Whilst climate change and sustainability were included as key drivers in the main Real-Time Delphi study, the striking evidence of participants shift in assumptions is evidenced by their temporary suspension of this litany level information (Inayatullah 2013), in their spontaneous inquiries. Basing on the contemporary arguments about cultured meat, particularly the Life Cycle Analysis (Fernandes et al. 2022; Nobre 2022), one would expect participants to field questions relating to reduced greenhouse gas emissions, reduced land and water footprint. Contrary to expectations (refer to table 3), the enquiries eschew the expected. Kaliji et al. (2025) highlighted the factors that influence adoption of cultured meat with ethical and environmental concerns as the leading factors (Figure 4).

The scarcity of quustions related to climate change and environmental concerns reinforces the earlier argument of meat being framed as a cultural artifact rather than a technological or climate change solution in Southern Africa.

6.1.3 | *Alignment With Food Security Narrative*

The food security narrative argues that cultured meat could provide affordable, accessible, health protein sources for the growing world population (Lin et al. 2026). Food security refers to when all all people have physical, social and economic access to sufficient, safe, nutritious and culturally acceptable food (Pérez-Escamilla 2024). The findings strongly align with the food security narrative as participants constantly framed cultured meat as a potential solution to food deficiencies' as questions were asked on affordability, accessibility and availability. For example, in these three questions: *Is cultured meat the main source of protein, Is cultured meat affordable? & Is cultured meat accessible?* In these questions, participants precisely picked the key words used to define food security.

6.2 | UIP in the Context of Other Cognitive Priming Techniques

In foresight science, there are many techniques and tactics used in activating long-term thinking and expand participants'

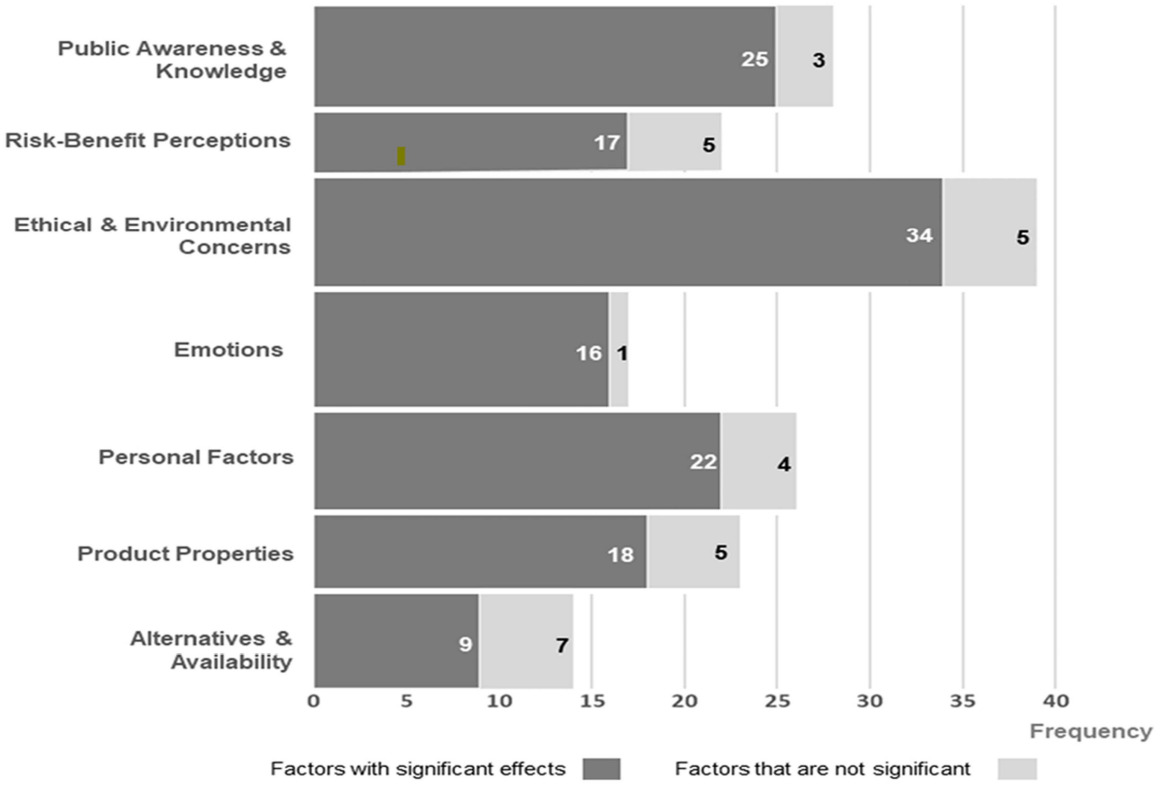

FIGURE 4 | Factors influencing adoption of culture meat. *Source:* (Pakseresht et al. 2022).

imaginative capacity. Whilst the Ubuntu Intergenerational Primer relates with some of these techniques, it brings some new perspectives which are predominantly culturally oriented. In foresight science, time is central as it defines horizons of anticipating change, more so change in transitional studies (Sacio-Szymańska 2023). Future time is conventionally expressed in years for example, 2040, 2070 horizon which often appear as titles for most foresight projects. On the contrary, the UIP reframes time horizon to generations, locating a specific relational figure in the next generations. Unconventionally, future generations are still used to measure passage of time in Southern Africa. Therefore, speaking to a grandchild causes a participant to re-adjust their cognition knowing they are operating in the realm of the next generation. Such a realization breaks the presentist focus and allows de-biased imagination.

Some cognitive priming techniques de-bias through encouraging thinking in intergenerational terms and intergenerational justice (Netshandama and Nevhudoli 2021). An example is Future generation envoy (Knudsen et al. 2023) which normally places proxies or representatives from the future. Such proxies are important because they provide checks and balances in present policy discussion by representing interests of future generations. However, in collectivist culture where relationships are important such a faceless proxies or representatives may not bring desired debiasing effect. Turning an expert from a mere professional to an Ancestor who is listening to their own next generation sets UIP apart from other techniques. The kinship between the ancestor and the future generation representative (a grandchild) potentially enlists and motivates the expert with a collectivist background. Unlike with generic future generation envoys, experts have an attachment to the foresight exercise in the UIP. This emotional attachment reassures candidness, reflexivity and natural motivation to participate.

6.3 | Potential Limitations

6.3.1 | *UIP Inverts the Indigenous Gerontocratic Hierarchies*

The Ubuntu Intergenerational Primer's "ask your grandchild" treads on cultural and ethical boundaries of reversing the social hierarchies, power structures and knowledge channels in regional cultural settings. By instructing participants (ancestors) to ask future grandchildren, the UIP introduces an exceptional reversal of traditional social and knowledge hierarchies. Traditionally, elderly people are regarded to be the source of knowledge, therefore, the grandchild should ask the ancestor, not the other way round. The Ubuntu-Intergenerational Primer risks falling short of Ubuntu expectations by inverting the social order and respect. However, we argue that this inversion is methodologically justified when addressing complex socio-technical transition questions for two reasons: First, the asymmetry of the future knowledge, where the participant (ancestor) cannot be expected to know the lived realities of the future more than the actual (imaginary) inhabitant. In this context, the grandchid is better positioned to be the source of knowledge in a typical reverse socialisation format. Second, a digital native precedent has already been set in the contemporary Southern African society. The elderly already look to younger "digital natives" for technological orientation and literacy (Sikhakhane and Roman 2025). This narrative sets a cultural precedence for ancestors to ask their descendants on matters to do with complex socio-technical transition.

6.3.2 | *Methodological Limitations*

This research is susceptible to methodological limitations. A study of this nature requires a comparative experimental approach with test groups on RVW and UIP. This methodological application allows logical scientific conclusions to be passed on the performance of these debiasing tools in research contexts. The current research relied on researchers lived experiences, practical foresight experience and general assumptions of the cultural settings of where the RVW has been applied. These assumptions cannot substitute scientific testing and validation of the primer. Since our study was not intending to conduct these experiments, we recommend experimental tests for scientific conclusions. That recommendation does not discount the benefits we realized in our current study due to UIP tactical intervention.

6.3.3 | *New Cognitive Biases*

Approaches and techniques such as future personas, role plays, science fiction and games are commonly used as cognitive mechanisms to increase creativity and futures thinking (Chang et al. 2025; Lesage et al. 2025; Reynante et al. 2025). From this perspective, the future grandchild was introduced as a cognitive mechanism that increases psychological proximity of a distant future and scaffolds the participants to reduce temporal discounting by makiing future personas cognitively salient. However, this intervention is susceptible to other cognitive biases that may limit the quality of the futuring efforts. Some of the potential biases are the kinship bias and the legacy bias. Kinship bias arises when participants reason from the perspective of protecting and favouring their own future descendants (Law et al. 2025; Tost et al. 2015).By prioritizing family centered futures, UIP may overlook the societal and planetary futures, a pattern that is supported by scarcity of climate change and sustainability questions from the list of intergenerational questions presented (see Table 3). Linked to kinship bias is legacy bias which emanates from the subconscious attempt to pass down or preserve some aspects of the present day (Bang et al. 2017; Syropoulos et al. 2024; Waggoner et al. 2023). From the current research, most cultural and traditional aspects were assumed to subsist into the future, whereas in reality,some of the cultural practices will be transformed or replaced while others will be maintained. In futures studies terms, the partcipants reasoning resembles some subtle elements of continuity, linearity and stewardship narratives.

6.4 | What Is Next for Ubuntu Intergenerational Primer?

6.4.1 | *Experimental Tests*

The next logical step on this research is the introduction of comparative experimental control trials. Unfortunately, these experiments were beyond the scope of the current study. These experiments should statistically isolate and validate the debiasing efficacy of Ubuntu Intergenerational Primer across

different participants groups. The experiments should be designed to quantify the variance in future discounting on UIP and Rip Van Winkle (and other priming tools) in individualist and collectivist cultures in order to give more scientifically based conclusions.

6.4.2 | *What About Giving the Grandchild a Voice?*

Both RVW and UIP simply ask questions and do not seek answers from future generations essentially because no one is in the future. The future is unknowable, unpredictable and highly uncertain (Barnett 2004; Ilmola and Rovenskaya 2016). An attempt to get direct answers from the future generations could be a misleading misrepresentation of futures studies and oversimplification of the complex future. Such an attempt does not fit in the domain of futures studies. The episodic mental time travels to the future are purely imaginations based on our knowledge of the present. However, the Yes or No questions could be potentially and responsibly addressed without misrepresenting the foresight science. The concept of imaginary future generation envoys is well established in futures studies (Fuchigami et al. 2025; Hara et al. 2019, 2026), thus, Yes or No questions from RVW and UIP can be responsibly addressed through intergenerational feedback illustrated on Figure 5. This could be possible by dedicating future envoy groups (or imaginary future grandchildren) to analyzing participants questions, assumptions and imaginations to give hypothetical responses. They may as well answer with Yes or No, giving interesting points of discussion, agreements and disagreements all under foresight discussions not deterministic predictions of the future. Through forming closed-loop intergenerational feedback, the dialog could be useful in critiquing current assumptions about the future as well as testing possible future scenarios.

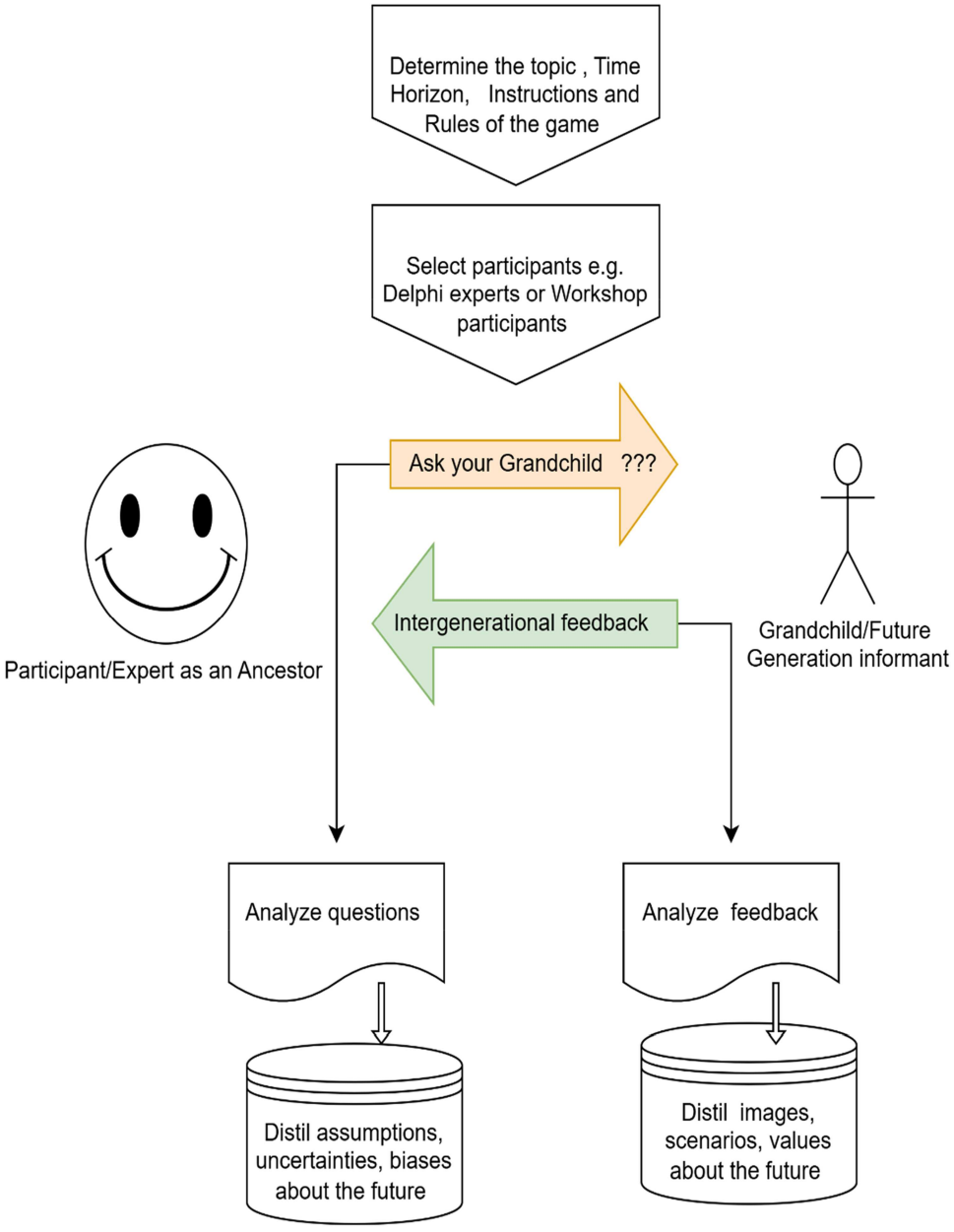

FIGURE 5 | The Ubuntu Intergenerational Primer with Intergenerational feedback. *Source:* Authors' illustration 2026.

7 | Conclusion

The study positions itself as a cognitive intervention to prepare Delphi participants for effective foresight engagement in Southern Africa collectivist and Ubuntu philosophical contest. The Ubuntu Intergenerational Primer was founded on relationality, collectivism and traditional ways of interpreting time. By encouraging participants to inquire from their future grandchildren, the UIP appeared to reduce future discounting bias, foster intergenerational responsibility and long-term well-being. Interpreted through the Social Practice Theory analytical framework, meanings around cultured meat dominated the questions asked to future grandchildren giving rise to the heritage preservation narrative. However, despite functioning to alleviate future discounting, the UIP seemed to be susceptible to kinship and legacy bias due to its excessive inclination towards narrow interest of family generations. This highlights an important methodological insight that interventions designed to reduce one cognitive bias may simultaneously activate other biases. Nonetheless, the study suggests that UIP offers a culturally grounded and contextually relevant technique to fostering long term thinking in Southern Africa, drawing from Ubuntu values of relationality (*ukama*) and intergenerational responsibility. Further work on the UIP was recommended to focus on comparative experimental tests for more scientific conclusions. A consideration for closed-loop intergenerational feedback was suggested to make the most out of intergenerational inquiries.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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