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A future beyond ourselves: Self-oriented prospection predicts increased intergenerational responsibility☆

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ABSTRACT

Do differences in how people think about their own futures predict responsibility for the collective future welfare of humanity? Across a reanalysis of existing data, four primary studies, six supplemental studies, and an internal meta-analysis (N_{Total} = 11,261 US participants), we investigate how individual differences in self-oriented prospection relate to intergenerational responsibility, elucidating theoretical and practical implications for the psychologies of future-thinking and intergenerational ethics alike. We consistently observe an association between Future Self-Continuity (FSC; variation in the amount of perceived overlap between people's present and future self-concept) and Consideration of Future Consequences (CFC; individual differences in tendencies to consider how present actions impact one's own future life outcomes) with increased feelings of responsibility for, perceived efficacy to impact, and identification with future generations. Drawing upon insights from behavioral economics, Construal Level Theory, and research on moral expansiveness, our results begin to reconcile the literatures studying the adaptive functions of self-oriented prospection with disparate lines of inquiry into the individual differences that mitigate tendencies to prioritize present over future generations. Moreover, the present findings open new avenues for further research to explore potential practical benefits of self-oriented prospection for bolstering efforts to improve long-term collective welfare.

As the world faces increasingly urgent existential challenges like climate change and global pandemics, the obligation of the current generation to protect the welfare of future generations is gaining significant attention within philosophical discussions (e.g., longtermism; Greaves & MacAskill, 2019; Ord, 2020), the sciences (Caviola et al., 2021; Law et al., 2024), and society at large (McLamb, 2022). Despite this, most people show a robust present-bias in their sense of duty. That is, while people generally feel responsible for the needs and well-being of the present generation, they often disregard the needs and well-being of future generations (Coleman & DeSteno, 2024; Hauser et al., 2014; Law et al., 2024; Syropoulos et al., 2023; Syropoulos, Law, & Young, 2024; Wade-Benzoni & Tost, 2009). Yet, individual differences in self-oriented prospection–how people think about their personal futures–are strong predictors of how successfully they plan and achieve positive life outcomes (e.g., Hershfield et al., 2009; Strathman et al., 1994). Could these differences in personal future-thinking or self-oriented prospection also be related to variations in levels of intergenerational responsibility–people's sense of duty to plan and achieve positive outcomes for the many future generations to come?

For decades, considerable research in psychology on the science of prospection has been dedicated to investigating how people think about their own personal futures (e.g., Schacter & Addis, 2020; Strathman et al., 1994). This research has shown that the human capacity for imagination serves the adaptive function of facilitating planning personal future outcomes (e.g., Addis, 2020; Hershfield et al., 2009). Meanwhile, inquiry across psychology and behavioral economics is beginning to shed light on how people may better plan for the collective future of society (e.g., Coleman & DeSteno, 2024; Hauser et al., 2014; Law et al., 2024; Syropoulos et al., 2023; Syropoulos, Law, & Young, 2024). Nonetheless, at present, these bodies of research have operated largely independently of one another, potentially overlooking theoretical and practical advancements that could arise from their synthesis.

☆ Materials for all studies are available on the Open Science Framework (OSF): https://osf.io/preprints/psyarxiv/29jeb.

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Here we investigate whether capacities in self-oriented prospection are related to levels of perceived responsibility for the collective future welfare of humanity (Intergenerational Responsibility or IGR).

Indeed, envisioning the futures of others is markedly more complex than envisioning one's own–feeling concern for the futures of others requires transcending not only the temporal divide, but also spans of social distance, as future generations comprise collectives of strangers those in the present generation will never meet (Wade-Benzoni & Tost, 2009). The confluence of social and temporal distance that separates future generations from current society raises the possibility that capacities in self-oriented prospection, which may seem principally suited for transcending temporal but not necessarily social distance, may offer little predictive power within the inherently other-oriented realm of Intergenerational Responsibility. Nonetheless, research on Construal Level Theory (Eyal et al., 2008; Gilead et al., 2020; Trope & Liberman, 2010) suggests that the capacities which support perspective-taking across spans of temporal and social distance rely upon a shared cognitive architecture. The overlap in how people process temporal and social distance suggests intergenerational responsibility may derive from or at least relate to capacities in self-oriented prospection after all. Furthermore, research and theory on moral expansiveness (e.g., Crimston et al., 2016; Graham et al., 2017; Law et al., 2024) suggest moral concern and obligation begin with the self and extend outward to include others across stretches of psychological distance. As such, it's possible that the capacity to envision and feel responsible for one's personal future life outcomes may be linked to a more expansive capacity to envision and feel responsible for the collective future of humanity.

1. Other-oriented constraints on intergenerational responsibility and variation in self-oriented prospection

Research in behavioral economics has consistently shown that people tend to prioritize present over future societal needs when distributing limited resources, a phenomenon known as intergenerational discounting (e.g., Frederick, 2003; Wade-Benzoni, 2008; Wade-Benzoni & Tost, 2009). More recently, research in social psychology has begun to uncover similar patterns of present-focused preferences in areas such as moral concern (Law et al., 2024), empathic responses (Coleman & DeSteno, 2024), and prosocial intentions (Syropoulos et al., 2023; Syropoulos, Law, & Young, 2024). A principle aim of this emerging research has been identifying psychological factors that might mitigate tendencies toward intergenerational discounting and boost levels of responsibility for future societal welfare. Specifically, motivations related to leaving a legacy (Wade-Benzoni & Tost, 2009; Zaval et al., 2015), feelings of gratitude toward previous generations (Watkins & Goodwin, 2020), and a commitment to impartial intergenerational beneficence (Law et al., 2024; Syropoulos et al., 2023; Syropoulos, Law, & Young, 2024) have been shown to predict farsighted, other-oriented attitudes and behaviors, including moral concern for future targets and the allocation of resources to benefit future generations.

While the findings above have illuminated pathways to foster real-world pro-future actions at the societal level, present-biases remain strong (e.g., Law et al., 2024; Wade-Benzoni & Tost, 2009; Coleman & DeSteno, 2024). What's more is that much of the existing research exploring psychological routes toward intergenerational responsibility has focused on individual differences in *other-oriented* psychological phenomena (e.g., feeling moral concern for future others, feeling grateful for the sacrifices of those who came before, being motivated to positively impact society for those who will come after). This is perhaps unsurprising given feeling responsible for the future of society inherently represents other-inclusive sense of duty. However, while people generally show constrained tendencies to look toward and plan for the collective future that society shares, people routinely look toward and plan for their *own* futures–a tendency often referred to as personal future-thinking or self-oriented prospection (e.g., Schacter & Addis, 2020; Strathman et al., 1994). Especially intriguing is that the present-biases which are known to limit people's sense of responsibility to future generations have their analogs in the context of self-oriented prospection as well. A key example of such biases is found in the robust tendency many show toward "Delay Discounting" (at times referred to as "Temporal Discounting")–a preference for smaller immediate rewards over larger ones in the future (Rachlin & Jones, 2008). But present-biases in self-oriented prospection vary widely, with people who show longer-term personal outlooks tending to engage in more farsighted self-beneficial behaviors that in turn influence positive long-term life outcomes (e.g., Hershfield et al., 2009; Strathman et al., 1994).

Human cognition is uniquely characterized by the capacity for subjective and symbolic self-reflection, setting us apart from other species (e.g., Gallup Jr., 1982). Our ability to envision and anticipate our future selves empowers us to guide present actions toward desired future outcomes (Sedikides et al., 2023). Central to this capacity is the phenomenon of Future Self-Continuity (FSC), encompassing the vivid imagination of one's future self and a sense of similarity with it (Hershfield et al., 2009). FSC varies across individuals and correlates with self-beneficial future-oriented behaviors, such as academic diligence (Blouin-Hudon & Pychyl, 2015), prudent financial decisions (Hershfield et al., 2009), health-conscious behaviors like exercise (Rutchick et al., 2018) and reduced tendencies to discount the subjective value of future rewards (i.e., temporal discounting; Faralla et al., 2021). Experimental manipulations can increase FSC within individuals, which can in turn influence attitudes and behaviors, such as an aversion to committing unethical behavior (Hershfield et al., 2012). Furthermore, the development of FSC is rooted in the capacity to vividly envision one's future self, foster a sense of identity with it, and possess a sense of efficacy over future outcomes (Hershfield & Bartels, 2018).

Similar to FSC, Consideration of Future Consequences (CFC; Strathman et al., 1994)– which involves deliberative foresight over the potential outcomes resulting from one's present actions–is another facet of self-oriented prospection that varies across individuals and predicts a multitude of self-beneficial future-oriented behaviors and outcomes (Strathman et al., 1994). For instance, higher levels of CFC predict positive longer-term outcomes including academic success, health-conscious decisions like smoking cessation, wise financial decision-making, and reduced temporal discounting (Joireman, 1999; Strathman et al., 1994). Analogously to FSC, CFC correlates positively with the ability to vividly envision one's future self (Rebetez et al., 2016; Stephan et al., 2018) and perceived efficacy over positively impacting future life outcomes (Azizli et al., 2015). Indeed, FSC and CFC tend to correlate positively, although weakly, with each other, suggesting some overlap in these abilities (Sokol & Serper, 2019).

To summarize, individual variation in self-oriented prospection, encompassing phenomena such as FSC (Hershfield et al., 2009) and CFC (Strathman et al., 1994), predict an array of behaviors that promote favorable outcomes for oneself. Moreover, both align with the ability to vividly imagine one's future self and heightened efficacy in shaping one's future station through present actions. However, the possibility of applying phenomena related to self-oriented prospection to help predict individual differences in Intergenerational Responsibility for the welfare of future others remains a valuable open avenue for investigation. Yet, despite limited attention, suggestive evidence (e.g., findings from Construal Level Theory; Gilead et al., 2020; research on moral expansiveness; Crimston et al., 2016) indicates that the psychological propensity to mentally traverse time for the benefit of one's future self may be linked to variations in how much individuals feel responsible for society's future welfare.

2. Is self-oriented prospection related to intergenerational responsibility?

Future Self-Continuity (FSC) and Consideration of Future Consequences (CFC) represent capacities in self-oriented prospection, with existing research mostly examining their impact on self-relevant

outcomes. However, a compelling possibility arises that both capacities might influence or at last relate positively to individual differences in perceptions of responsibility for the welfare of future generations. For one, both self-oriented prospection and feelings of concern for future generations inherently involve transcending spans of psychological distance in the mind's eye, suggesting the ability to envision and feel connected to one's future *self* may be related to levels of concern for future *others*.

Although self-oriented and other-oriented prospection differ in meaningful ways–self-oriented prospection primarily involves overcoming temporal distances, while other-oriented prospection also involves overcoming social distances (Wade-Benzoni & Tost, 2009)–research on Construal Level Theory (Trope & Liberman, 2010) indicates that the psychological capacities required to feel close to both temporally and socially distant targets are largely similar. For example, individuals who are more likely to discount the value of their own future rewards also tend to discount the subjective value of rewards for socially distant others (e.g., strangers and mere acquaintances compared to family members and friends; Hill et al., 2017). Additionally, both social and temporal distance considerations share a common structural and functional architecture at both the cognitive and neural levels (Gilead et al., 2020). Consequently, individuals who are adept at self-oriented prospection might also excel at other-oriented prospection due to this cognitive and neural overlap and feel a greater sense of duty for not only their own future welfare, but also the future welfare of those to come.

Research and theory in moral psychology offer further support for a potential link between self-oriented prospection and other-oriented intergenerational responsibility. Specifically, empirical investigations into the concept of the expanding moral circle (e.g., Crimston et al., 2016)–first introduced in ethical philosophy (Lecky., 1869; Singer, 1981)–provide a conceptual framework for understanding how individuals extend moral concern to others across increasing psychological distances. This research underscores that moral concern for others' welfare typically begins with the self and gradually expands to encompass more psychologically distant targets (e.g., Crimston et al., 2016; Graham et al., 2017; Waytz et al., 2019).

The framework of the expanding moral circle is particularly noteworthy in light of prominent critiques leveled against recent calls in political (e.g., González-Ricoy & Gosseries, 2016) and ethical (e.g., MacAskill, 2022) philosophy advocating for an extension of moral concern and actions to protect future generations. Critics of these calls for farsighted action have argued that future-oriented concern is inherently in competition with concerns for the self or for others in the present (e.g., Crary, 2023). However, the moral expansiveness framework posits that concern for one's own well-being does not compete with concern for others at greater social and temporal distances. Rather, self-concern forms the foundation from which moral regard naturally extends outward, gradually encompassing close others, distant others, non-human animals, and potentially, even future generations.

Much of the early research on moral expansiveness has focused on the extension of moral concern to present-day others across *social* distance (e.g., to outgroups and stigmatized persons; Crimston et al., 2016; Graham et al., 2017; Waytz et al., 2019). Nonetheless, emerging research suggests that moral concern extends similarly outward from the present self to others across *time*, encompassing targets in progressively more distant future generations (Law et al., 2024; Syropoulos, Law, & Young, 2024). As such, the moral expansiveness framework provides an account for how psychological processes that support self-oriented prospection may serve as an initial basis for more expansive perceptions of moral duty that include even far-future generations. Nonetheless, the present research on moral expansion across the temporal dimension has yet to address the relationship between self-oriented prospection and the degree of obligation people feel for the generations to come directly.

Finally, both self-oriented prospection and Intergenerational Responsibility share a common forward-thinking component. Recent research shows that the ability to vividly imagine distant futures is associated with greater moral concern and stronger intentions to protect future generations (Law et al., 2024) and distant others more broadly (O'Connor & Fowler, 2023). The benefits of vivid imagination for driving expansive prosociality, combined with findings linking FSC and CFC to the capacity for vividly envisioning hypothetical futures (Rebetez et al., 2016; Stephan et al., 2018), suggest a shared cognitive foundation for thinking about both one's future self and feeling duty to others across time.

3. Potential mechanisms linking self-oriented prospection to intergenerational responsibility

If capacities in self-oriented prospection indeed predict Intergenerational Responsibility, then it is worth examining candidate psychological mechanisms that may support these relationships. Specifically, we consider two constructs highlighted in seminal theoretical discourse on intergenerational resource allocations from behavioral economics (see Wade-Benzoni & Tost, 2009 for review) which find additional peripheral backing from more recent research in psychology. The first of these two candidate mechanisms is a broadened sense of identity that extends beyond the self to encompass future others within one's self-concept–a future-other-inclusive sense of identity we refer to as Intergenerational Identification.

The manner in which individuals perceive themselves in relation to future generations has been discussed in theoretical discourse on factors likely to predict a greater willingness to make economic sacrifices for the sake of future societal welfare (Wade-Benzoni, 2008; Wade-Benzoni & Tost, 2009). This perspective, advancing that processes in self-identity may be related to intergenerational responsibility, dovetails with the framework of moral concern for psychologically distant others expanding outward from the self (e.g., Crimston et al., 2016; Law et al., 2024). Empirically, possessing a stable and robust self-identity, a core component of FSC (Hershfield et al., 2009), is strongly associated with heightened empathy and prosocial behavior toward others across social distances (Krol & Bartz, 2022). Moreover, FSC has been linked to increased positive self-regard and overall life satisfaction (Sokol & Serper, 2019), factors that contribute to the cultivation of empathy and prosociality (Brethel-Haurwitz & Marsh, 2014). While explicit research on the direct link between FSC and other-oriented Intergenerational Responsibility is currently limited, the connections between FSC and a stronger sense of identity with oneself, alongside evidence linking self-identity with empathy and prosocial behaviors across psychological distances, underscore the likelihood of a positive association.

We propose that one plausible mechanism for this association is that individuals with greater FSC might not only have a stronger sense of self-identity but also an expansive sense of identity that transcends self-boundaries to include others, even those in distant contexts (e.g., future generations). Critically, the role of capacities in self-oriented prospection has not been directly explored within behavioral economics theorizing about identity in the context of other-oriented future concern. However, psychological research suggests that a future-other-inclusive identity may arise from the same capacities that support how we think about our future selves. People typically consider their future selves similarly to strangers (Pronin et al., 2008). Yet, individuals with elevated FSC deviate from this trend, viewing their future selves as extensions of their present selves (Hershfield et al., 2009). This implies that individuals with high FSC may have a unique capacity for maintaining a sense of identity across psychological distance.

Moreover, the expansion of moral concern from oneself to distant others is partly driven by tendencies to derive one's self-identity based on identification with psychologically distant others. Namely, research has linked a broader sense of identity with others, such as a perceived psychological connection with all of humanity (McFarland et al., 2012), to expansive moral regard for future generations (Syropoulos, Law, Amormino, & Young, 2024) and for socially distant present-day

strangers (Crimston et al., 2016). Taken together, these findings suggest that the capacity to perceive greater FSC may contribute to a heightened sense of Intergenerational Identification, which may, in turn, predict feelings of Intergenerational Responsibility.

Beyond feeling a greater sense of future-other-inclusive identity, the behavioral economics literature on intergenerational resource allocation suggests that perceptions of one's efficacy in influencing future outcomes may be another key determinant in prioritizing future welfare (see Wade-Benzoni & Tost, 2009). Notably, both FSC and CFC are linked to an individual's sense of efficacy in shaping their *own* future (e.g., Azizli et al., 2015). However, a broader sense of efficacy in influencing future outcomes has also been tied to prosocial behaviors and intentions directed toward future *others*, such as support for environmental initiatives, charitable donations, and longtermist beliefs (Hornsey et al., 2021; Syropoulos, Law, & Young, 2024). Perhaps most significantly, greater future-efficacy has been associated with heightened moral concern and a sense of obligation toward future generations (Law et al., 2024).

This opens the question of whether FSC and CFC, while traditionally focused on one's own future, might extend to fostering a sense of efficacy in positively influencing the lives of others in future societies. This possibility seems reasonable given that self-oriented prospection, which is linked to effective planning for personal future challenges, is also associated with the ability to vividly envision hypothetical futures more broadly (Rebetez et al., 2016; Stephan et al., 2018–a cognitive process that may support envisioning solutions to the grand challenges facing society. If so, a shift in Intergenerational Efficacy could potentially lead to a heightened sense of responsibility, encouraging individuals to contribute actively to the well-being and protection of future generations.

4. The current research

Here, we explore whether self-oriented prospection is related to other-oriented responsibility to safeguard the long-term future welfare of humanity. In Study 1, our first primary study and a pre-registered investigation, we find evidence that CFC and FSC–two distinct indicators of self-oriented prospection–relate positively to intergenerational responsibility. In Study 2, we employ a mediation model to test candidate mechanisms through which CFC and FSC might relate to intergenerational responsibility, focusing specifically on intergenerational efficacy and an expansive sense of self-identification that includes future generations (intergenerational identification) as possible mediators. In Studies 3a-3b we sought to evaluate these associations causally. Although mixed evidence was noted for a causal influence of the predictors and mediators on intergenerational responsibility, an internal meta-analysis across all studies (Ns ranging from 5343 to 8608) revealed robust evidence that individual differences in self-oriented prospection, as well as intergenerational efficacy and identification, showed reliable positive associations, ranging from moderate to strong in magnitude, with intergenerational responsibility.

Importantly, six supplementary studies reported in the Supplementary Online Materials (SOM) directly replicated these results; conceptually replicated associations with alternative measures of self-oriented prospection and intergenerational responsibility, and also served as pilot tests of our experimental stimuli. Data files, code and surveys (for all primary analyses) can be found on the Open Science Framework (OSF) https://osf.io/xfkdq/?view_only=fc07f6a6ff024dbe9a684cf8733d0aa2. Table 1 presents key information for all studies.

5. Study 1

5.1. Study 1

In our first (and pre-registered: https://aspredicted.org/Y6J_QM4) primary study, we reevaluated the association of self-oriented prospection (as captured by scores on the Consideration of Future Consequences [CFC] Scale) with IGR (as captured by scores on the Responsibility to Future Generations [RFG] Scale). We also considered an additional individual difference in self-oriented prospection that has been shown to predict concern for one's own future life outcomes, namely Future Self-Continuity (FSC). Importantly, to avoid repetition and provide clarity on the differences between the various predictors capturing self-oriented prospection and outcome measures capturing IGR used across studies, we provide an overview of these measures in Table 2.

5.2. Methods

5.2.1. Participants

We recruited 299 participants via Amazon's Mechanical Turk (MTurk). After excluding 10 participants for failing the attention check, 289 remained. Informed consent was obtained online at the beginning of the survey.

5.2.2. Materials

Participants completed the following measures in a randomized order. To capture various facets of self-oriented prospection, we included the seven-item CFC Scale ($\alpha = 0.86$; Strathman et al., 1994; e.g., "I consider how things might be in the future and try to influence those things with my day to day behavior.") and the six-item FSC Scale ($\alpha = 0.94$; Hershfield et al., 2009) to capture CFC and FSC, respectively. On the FSC Scale, participants reported their perceptions of connectedness and similarity between their present and future selves 1, 5, and 10 years in the future. Responses were captured on a 7-point Likert scale from *1 (not at all)* to *7 (very much)*.

IGR. The five-item RFG Scale (Syropoulos et al., 2020; e.g., "People living today have an obligation to protect future generations, even if it

Table 1
Information for all studies.

Study number	Type	Sample	Pre-registered	N_{Total}	N_{woman}	M_{age}
Primary studies						
1	Correlation	CloudResearch	Yes	289	137	43.59
2	Correlation	Prolific	No	345	169	40.31
3a	Experiment	Prolific	Yes	1598	758	37.13
3b	Experiment	Prolific	Yes	2674	1274	40.90
Supplementary studies						
S1	Secondary analysis	MTurk	No	2244	1302	33.21
S2	Correlation	Prolific	Yes	300	142	38.93
S3	Correlation	Prolific	No	1391	684	41.68
S4	Correlation	Prolific	Yes	728	348	36.17
S5	Experiment	CloudResearch	Yes	432	189	41.81
S6	Experiment	Prolific	No	1260	601	41.43

Table 2
Information on all key measures of the investigation.

Category	Measures of constructs within each category	Exemplary item(s)	Thematic focus	Target	Citation	Studies
Self-Oriented Prospection	Consideration of Future Consequences	"I consider how things might be in the future, and try to influence those things with my day to day behavior"	How much does one consider the future outcomes of their own actions?	Self	Strathman et al., 1994	Primary Studies: 1, 2, 3a, 3b Supplementary Studies: 1, 2, 4, 5
	Future Self-Continuity Scale (2 formats: 6-item and Graphic)	6-Item Scale: "How connected/similar do you feel to yourself 1/5/10/25 years in the future?" Graphic Scale: "Select the pattern from the image above that best describes your connection to your future self, 25 years from now".	How connected does one feel to their own self in the future? How similar is one's future self to who they are now?	Self	Hershfield et al., 2009	Primary Studies: 1, 2, 3a, 3b Supplementary Studies: 4, 5, 6
	Future Time Perspective	"I am willing to sacrifice my immediate happiness or well-being in order to achieve something in the future."	How willing is one to put aside present desires to achieve personal future goals?	Self	Lalot et al., 2021	Supplementary Studies: 2, 3
Intergenerational Responsibility (IGR)	Responsibility to Future Generations Scale (RFG Scale)	"To what extent do you truly feel it is your personal responsibility to save resources for future generations, even if it means making do with less in your own life?"	How much personal responsibility does one feel to ensure future people have a better life?	Others/Future generations	Adapted from Syropoulos et al., 2020	Primary Studies: 1, 2, 3a, 3b Supplementary Studies: 1, 2, 4, 5, 6
	Social Generativity	"I think that I am responsible for ensuring a state of well-being for future generations."	To what extent does one feel responsible for and committed to ensuring the welfare of future generations?	Others/Future generations	Morselli & Passini, 2015	Supplementary Studies: 2, 3
	Impartial Intergenerational Beneficence Inventory (IIBI)	"It is important that we reduce existential and extinction risks to humanity and promote sustainable development goals to ensure the long-term survival of future generations."	Classifies whether people manifest exceptional intergenerational responsibility regardless of when future generations might exist.	Others/Future generations	Syropoulos et al., 2023	Supplementary Study: 4
Hypothesized Mediators	Intergenerational Identification (Identification)	"To what extent do you feel connected to future generations of people?"	To what extent does one feel an overlapping sense of identity with humanity across time?	Others/Future generations	Generated by research team	Primary Studies: 2, 3a, 3b Supplementary Study: 4
	Intergenerational Efficacy (Efficacy)	"Our actions today can greatly influence the well-being of future generations"	To what extent does one feel people in the present can positively influence the lives of future generations?	Others/Future generations	Generated by research team	Primary Studies: 2, 3a, 3b Supplementary Study: 4

means tightening our belts now"; $a = 0.87$) was used to capture intergenerational responsibility (IGR), employing a 7-point Likert scale (higher scores correspond to greater IGR; see SOM for details).

5.3. Results

Supporting our hypotheses, both CFC ($r = 0.49, p < .001$) and FSC ($r = 0.30, p < .001$) correlated positively with IGR, as captured by scores on the RFG Scale. Estimating linear regressions with both CFC and FSC in the model, we found that both CFC ($\beta = 0.44, p < .001$) and FSC ($\beta = 0.16, p = .002$) related to increased IGR (Adjusted R2 = 0.26) even when controlling for each other.

5.3.1. Supplementary results

Supplementary study 1. In a secondary analysis (see Supplementary Study 1 in SOM) of existing and previously-published data (Syropoulos et al., 2020; Syropoulos & Markowitz, 2021), we were able to re-evaluate the association between CFC with a measure of IGR. Across 2244 participants and 5 different samples, the average correlation between CFC and IGR was positive, and moderate to strong in magnitude ($r = 0.48$, $Z = 24.88$, $p < .001$, 95 % C.I. [0.45, 0.51]). Informed consent was obtained online at the beginning of the survey.

Supplementary study 2. To rationalize our choice of using a shorter CFC scale to hedge against participant fatigue, we re-examined correlations between different versions of a CFC scale, namely a 3-item, a 7-item and 12-item version, with IGR (see Supplementary Study 2 in SOM). In a Prolific sample of Americans ($N = 300$), we found that all CFC measures, (i.e., 3-item, 7-item and 12-item versions) had good reliability ($as \geq 0.86$), correlated very strongly with each other ($rs \geq 0.90$, $ps < 0.001$) and also correlated strongly with scores on the measure of IGR ($rs \geq 0.43$, $ps < 0.001$). Considering this, in subsequent studies, to keep participant fatigue to a minimum, we employed shorter versions of the CFC measure. Informed consent was obtained online at the beginning of the survey.

Supplementary study 3. In an integrative analysis of two separate datasets collected on Prolific ($N = 1391$), we conceptually replicated our results by utilizing alternative measures of self-oriented prospection and IGR. In this study, self-oriented prospection was captured with the Future Time-Perspective subscale of the Future Consciousness Scale (Lalot et al., 2021), which assesses individual differences in long-term personal future-thinking in a manner conceptually similar to CFC. IGR was captured with the Social Generativity Scale (Morselli & Passini, 2015) instead of the RFG scale, another measure that directly captures responsibility to future generations. Crucially, a positive and strong correlation was noted ($r = 0.52$, $p < .001$). Informed consent was obtained online at the beginning of the survey.

5.4. Discussion

Taken together, results from our primary study and three supplementary studies suggest that individual differences in self-oriented prospection–whether expressed as greater consideration of the future outcomes of one's actions (CFC), heightened Future Self-Continuity (FSC), or elevated Future Time Perspective–predict greater feelings of Intergenerational Responsibility (IGR). Having established a robust pattern of correlations, we next investigated potential mechanisms

underlying these associations (i.e., mediators).

6. Study 2

We considered two possible mechanisms that both CFC and FSC could positively relate to, which in turn could explain their association with IGR. The first was Intergenerational Identification. It's possible that people who identify more strongly with their future selves (FSC) could also identify more with future people in general. The second we considered was Intergenerational Efficacy, otherwise stated as the belief that our actions now can positively influence the well-being of future generations. If people believe their present actions have the power to shape their own futures (CFC), they might also be more likely to believe they have the power to shape others' futures. Both potential mechanisms have been acknowledged as important levers underlying intergenerational resource allocations (e.g., Wade-Benzoni & Tost, 2009), but importantly, neither has been examined with respect to individual differences in self-oriented prospection.

6.1. Methods

6.1.1. Participants

We recruited 350 participants on Prolific. One participant with a duplicate IP address, and 4 who failed our attention check, were excluded, leaving 345 participants. A sensitivity analysis (using G*power3, Faul et al., 2007) with power set to 0.80 suggested we could meaningfully detect correlations as small as $r = 0.15$. Informed consent was obtained online at the beginning of the survey.

6.1.2. Materials and procedure

To capture individual differences in self-oriented prospection, participants completed the CFC Scale from Study 1 ($\alpha = 0.80$) and a graphically formatted version of the FSC Scale. Namely, FSC was captured using a single item on which participants chose between 7 Venn-diagrams with various degrees of overlap to convey their perceived level of continuity between their present and future self, 25 years in the future (Hershfield et al., 2009; higher scores correspond to greater FSC).

Participants also responded to six new items to capture the two hypothesized mediators. Three items generated by the research team ("Our actions today can greatly influence the well-being of future generations", "We can make a difference to the world that future generations will inhabit", "The future where everyone can live a joyous life is impacted by our decisions today.") captured Intergenerational Efficacy (i.e., Efficacy; $\alpha = 0.92$). Each item was captured on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree).

Intergenerational Identification (i.e., Identification) was also captured with 3 items. Two items ("To what extent do you feel connected to future generations of people?", "It is easy for me to put myself in the shoes of future generations of people.") were captured on the same slider scale ranging from 0 (not at all) to 100 (extremely). The third item used a graphic scale mirroring that used to capture FSC, but instead of oneself, the other entity depicted in the Venn-diagrams represented "future generations of people". In our analyses, we transformed scores for the first two items to be on a 7-point scale by using the following formula: ((original score − 0) / (100−0)) * (7–1) + 1) and averaged the three items ($\alpha = 0.89$).

Participants completed the measures in a randomized order, grouped based on their status as predictors (CFC and FSC), mediators (Efficacy and Identification) and outcome (i.e., IGR captured using the same RFG Scale as Study 1).

6.2. Results

Replicating the prior results, greater self-oriented prospection, namely CFC and FSC, related to increased IGR (see Table 3). Moreover, individual differences in FSC and CFC correlated moderately and positively with each other, and, as hypothesized, with increased Efficacy and Identification. Notably, however, the association between CFC with Efficacy was significantly stronger than that between FSC with Efficacy (*Fisher's* $Z = 3.93$, $p < .001$).

Although no evidence for a causal relationship can be drawn from these correlational data, a mediation test with CFC and FSC as parallel predictors, Efficacy and Identification as parallel mediators, and IGR as the outcome was estimated with the *proc calis* command. This analysis supported our argument for a potential indirect effect (see Fig. 1). Importantly FSC had a non-significant indirect effect via Efficacy ($b = 0.01$, $p = .614$, 95 % C.I. [−0.02, 0.03]), but a significant indirect effect via Identification ($b = 0.11$, $p < .001$, 95 % C.I. [0.07, 0.14]). CFC had a significant indirect effect via both Efficacy ($b = 0.20$, $p < .001$, 95 % C.I. [0.15, 0.27]) and Identification ($b = 0.14$, $p < .001$, 95 % C.I. [0.09, 0.19]). See SOM for confirmatory results from Supplementary Study 4.

6.3. Discussion

Study 2 further suggests that individual differences in self-oriented prospection, captured by CFC and FSC, relate to increased IGR. Crucially, both CFC and FSC were also associated with Intergenerational Efficacy and Identification. However, when we examined these associations concurrently in a mediation model, FSC related only to Identification, while CFC related to both proposed mediators. Both mediators, in turn, positively related to IGR, with three out of four proposed indirect effects emerging as significant.

7. Study 3a

In our next pre-registered (https://aspredicted.org/SJF_P3S) study, we sought to experimentally manipulate CFC and FSC using manipulations that were validated in two supplementary pilot studies (see Supplementary Studies 5 and 6 in SOM; for each of these studies, informed consent was obtained online at the beginning of the survey). We sought to determine whether inducing self-oriented prospection would increase IGR directly, as well as indirectly via increased endorsement of the two proposed mediators tested in Study 2.

Table 3
Bivariate correlations between all measures.

Measure	M	SD	CFC	FSC	FG Efficacy	FG Identification	IGR (RFG Scale)
CFC	5.22	1.12	–				
FSC	4.28	1.69	0.28**	–			
FG Efficacy	5.79	0.98	0.53**	0.17*	–		
FG Identification	3.74	1.42	0.44**	0.47**	0.44**	–	
IGR (RFG Scale)	4.99	1.30	0.61**	0.24**	0.64**	0.61**	–

* $p < .01$.
** $p < .001$.

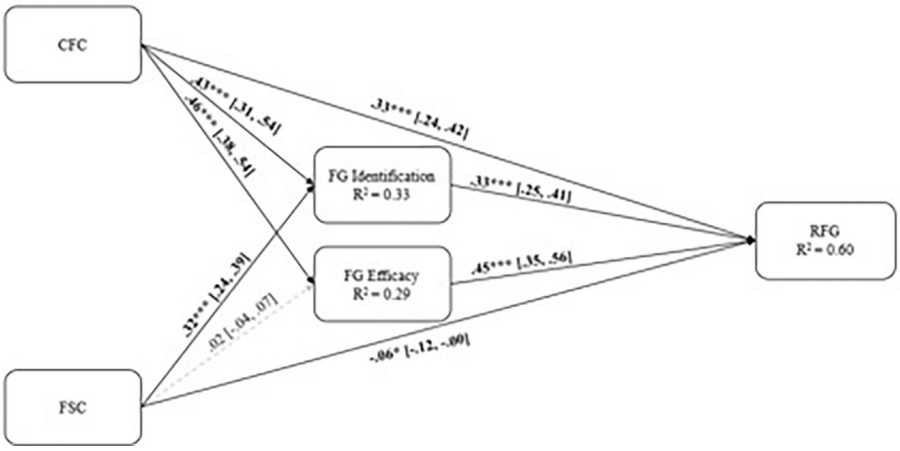

Fig. 1. Path model depicting the unstandardized coefficients with 95 % C.I. for the mediation test
Note. * $p < .05$, ** $p < .01$, *** $p < .001$. IGR was captured using the RFG Scale.

7.1. Methods

7.1.1. Participants

A starting sample of 1656 participants was recruited via Prolific. Although we were aiming to recruit 1650 participants, six participants completed the survey but dropped out of the study prior to receiving compensation on Prolific. After excluding 5 participants who had a duplicate IP address and another 50 who failed our attention check, 1598 participants remained. This sample size was in line with our a-priori power analysis (see pre-registration). Informed consent was obtained online at the beginning of the survey.

7.1.2. Materials and procedure

Participants were randomly assigned to one of three conditions. In each condition they completed a short writing task. For the CFC condition, the task was adapted from a previous study (Hershfield et al., 2012). For the FSC condition, the task was created by the research team. Both were independently validated (see Supplementary Studies 5 and 6 in the SOM).

The writing prompts participants completed were as follows: (1) CFC condition ($N = 516$): "Think about a time when you had to make a sacrifice to your immediate happiness in order to achieve a future outcome. Write about what you did to prioritize your future well-being and how you considered the future consequences of your actions."; (2) FSC condition ($N = 536$): "In many important ways, people remain the same over time. Recent research in psychology has found that at their core, people are very similar from one period of time to another. Please think about what you will be like in 25 years and list all of the ways in which you think you will be similar to how you are now."; Control condition ($N = 546$): "People tend to have a day-to-day routine. This includes activities they do during the day and before they go to bed. Please think about what your daily routine is and describe it below."

Subsequently, participants completed the following measures, using the same metrics as Study 2, in a randomized order: CFC Scale ($\alpha = 0.77$), FSC Graphic Scale, RFG Scale (to capture the outcome, IGR; $\alpha = 0.89$), Intergenerational Efficacy ($\alpha = 0.89$), and Intergenerational Identification (this time with all three items captured on 7-point scales, $\alpha = 0.87$).

7.2. Results

All variables were positively associated with each other, replicating results from our previous studies (see Table S7 in SOM). Per our pre-registered analytical plan, we first examined differences for the CFC and FSC conditions relative to the control condition.

7.2.1. FSC vs. control

Participants in the FSC condition reported greater FSC ($t(1073.3) = 6.39$, $p < .001$, $d = 0.39$), and CFC ($t(1078) = 2.15$, $p = .031$, $d = 0.13$), although the latter finding was notably unexpected and smaller in magnitude. Contrary to our pre-registered hypothesis, no significant effect was observed on Efficacy ($t(1080) = 1.84$, $p = .065$, $d = 0.11$) nor Identification ($t(1080) = 1.50$, $p = .133$, $d = 0.09$). However, a significant difference in the pre-registered direction was observed for IGR ($t(1073.6) = 3.98$, $p < .001$, $d = 0.24$).

7.2.2. CFC vs. control

Participants in the CFC condition reported greater CFC ($t(1051.7) = 5.71$, $p < .001$, $d = 0.35$), but not FSC ($t(1060) = 0.48$, $p = .631$, $d = 0.03$), as expected. Contrary to our pre-registered hypothesis, no significant effect was observed on Efficacy ($t(1052.6) = 1.62$, $p = .105$, $d = 0.10$) nor Identification ($t(1060) = 1.55$, $p = .122$, $d = 0.09$). However, a significant difference in the pre-registered direction was observed for IGR ($t(1060) = 2.65$, $p = .008$, $d = 0.16$). See Fig. 2 for a graphical depiction of these results.

7.3. Discussion

Study 3a partially supported our hypotheses. We successfully manipulated consideration of future consequences (CFC) and future self-continuity (FSC) using a writing task, finding direct effects on IGR. However, we did not observe any effects on our proposed mediators. Considering the non-significant results on the mediators, we deviated from our pre-registration and did not test for the potential indirect effect of condition on the outcomes via increased perceived efficacy for positively influencing future generations and identification with future generations. Nonetheless, we did replicate our prior findings showing positive associations between both measures of self-oriented prospection with Intergenerational Responsibility (IGR).

8. Study 3b

In our next experiment, we sought to both replicate the results of Study 3a, via a direct pre-registered replication, and expand on them by manipulating Intergenerational Efficacy and Identification directly. To do so, we adapted the Study 3a manipulations of CFC (for Efficacy) and of FSC (for Identification) and compared them to a control condition. This study was pre-registered, https://aspredicted.org/Z24_N6Y.

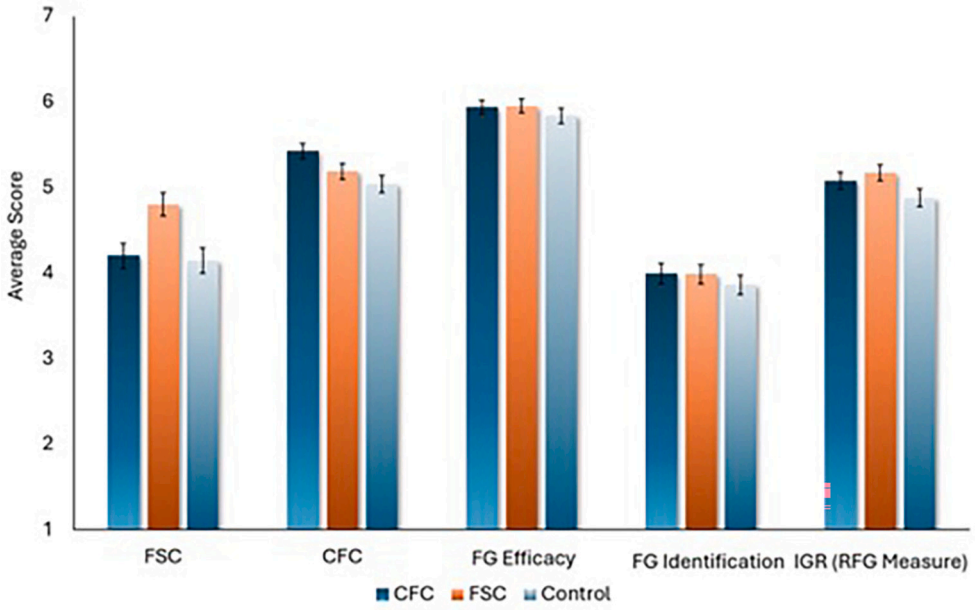

Fig. 2. Bar graph with 95 % C.I. depicting mean differences by condition.

8.1. Methods

8.1.1. Participants

A starting sample of 2750 participants was recruited via Prolific. After excluding 19 participants who had a duplicate IP address, and another 57 who failed our attention check, 2674 participants remained. This sample was in line with our a-priori power analysis (see pre-registration). Informed consent was obtained online at the beginning of the survey.

8.1.2. Materials and procedure

Participants were randomly assigned to one of five conditions. In each condition they completed a short writing task. The tasks for the CFC ($N = 540$), FSC ($N = 564$), and Control ($N = 569$) conditions were identical to Study 3a.

In the Efficacy condition ($N = 465$), participants responded to the following prompt: "Think about a time when you had to make a sacrifice to your immediate happiness in order to help future generations of people. Write about what you did to prioritize the well-being of future people and how you considered the consequences of your actions for future generations." Since we expected a CFC➔Efficacy➔IGR indirect effect, we attempted to mirror the CFC condition's framing.

In the Identification condition ($N = 536$) participants responded to the following prompt: "In many important ways, generations of people remain the same over time. Recent research in psychology has found that at its core, societies are very similar from one period of time to another. Please think about what you think future generations of people will be like in 25 years and list all of the ways in which you think future generations of will be similar to present generations of people." Since we expected an FSC➔Identification➔IGR indirect effect, we attempted to mirror the FSC condition's framing.

Participants then completed the following measures in a randomized order using identical metrics to Study 3a, except where noted: CFC Scale ($a = 0.80$), FSC Graphic Scale, RFG Scale ($a = 0.89$), Efficacy, for which 1 item was removed (2 items, $a = 0.89$), and Identification, for which only the overlapping circle items was included.

8.2. Results

All variables were positively associated with each other, replicating results from our previous studies (see Table S7 in the Supplementary materials). Per our pre-registered analytical plan, we first examined differences for the CFC and FSC condition relative to the control condition. Means and standard deviations can be found in Table 4.

8.2.1. FSC vs. control

Participants in the FSC condition reported greater FSC ($t(1118) = 6.87, p < .001, d = 0.41$) compared controls. However, even though our manipulation was successful, no significant condition effect was observed on IGR ($t(1131) = -1.06$, $p = .288$, $d = 0.06$), failing to replicate the findings of Study 3a.

8.2.2. CFC vs. control

Participants in the CFC condition reported greater CFC ($t(1103.4) = 3.97, p < .001, d = 0.24$) compared to the control. However even though our manipulation was successful, no significant condition effect was observed on IGR ($t(1107) = 0.01$, $p = .995$, $d = 0.0003$), failing to

Table 4
Means and standard deviations for the five conditions.

	Control	CFC	FSC	Efficacy	Identification
FSC					
M	4.52	4.58	**5.17**	4.58	4.50
SD	1.68	1.73	1.49	1.74	1.73
CFC					
M	5.24	**5.50**	5.13	**5.42**	5.18
SD	1.13	1.01	1.20	1.12	1.18
Intergenerational Responsibility (RFG Scale)					
M	5.05	5.05	4.98	**5.23**	5.07
SD	1.19	1.23	1.28	1.16	1.20
Efficacy for positively influencing future generations					
M	5.93	5.91	5.92	5.96	5.94
SD	0.96	1.00	1.03	1.07	0.99
Identification with future generations					
M	3.70	3.80	3.87	**3.92**	3.84
SD	1.64	1.56	1.56	1.65	1.63

Note. Bolded values highlight significant differences relative to the control condition.

replicate the findings of Study 3a.

8.2.3. Efficacy vs. control

Relative to controls, participants in the Efficacy condition scored significantly higher on CFC ($t(1032) = 2.48$, $p = .010$, $d = 0.16$), Identification ($t(1032) = 2.19$, $p = .029$, $d = 0.14$), and IGR ($t(1032) = 2.38$, $p = .017$, $d = 0.15$). However, no significant condition effect was observed on Efficacy ($t(939.3) = 0.52$, $p = .601$, $d = 0.03$), which limits our confidence in the treatment's validity as a viable manipulation of the intended construct. It's possible that the treatment instead acted to manipulate levels of Intergenerational Identification by making salient one's past engagement in intergenerational prosociality.

8.2.4. Identification vs. control

No significant condition differences were found on IGR ($t(1103) = 0.24$, $p = .813$, $d = 0.01$), Efficacy ($t(1103) = 0.13$, $p = .896$, $d = 0.01$), nor Identification ($t(1103) = 1.44$, $p = .150$, $d = 0.09$), suggesting the manipulation was not successful.

8.3. Discussion

Study 3b failed to replicate the effects of CFC and FSC manipulations on IGR. Importantly, we are confident that our manipulations were valid, as they shifted the intended constructs. These results suggest that, at least in a causal manner, it's not clear whether increasing consideration of future consequences and future self-continuity will necessarily result in more responsibility for protecting future people, at least when writing tasks are the means of manipulation. This could suggest that a potential moderator not tested in the present investigation could moderate the chances of self-oriented prospection resulting in increased intergenerational responsibility. Nevertheless, our attempts to manipulate intergenerational Efficacy and Identification were also met with limited success. Counterintuitively, our Efficacy manipulation shifted Identification but not Efficacy. Further, it shifted self-oriented prospection (CFC), and IGR (scores on the RFG Scale).

Given the inconsistent experimental results in Studies 3a-3b, we cannot confidently claim that experimentally manipulating the target predictors will result in increases in Intergenerational Responsibility. To better elucidate the open question of causality, further research is needed to develop more robust and better-targeted interventions. Nonetheless, we find reliable evidence across studies that people who tend to score higher on measures of self-oriented prospection (CFC, FSC) also tend to score higher on measures capturing individual differences in IGR.

9. Meta-analysis of associations across studies

The present investigation affords us the opportunity to conduct internal meta analyses of the hypothesized associations between primary measures of interest. Samples for each meta-analytical coefficient ranged from 5343 to 8608, offering us a robust sample size to estimate average meta-analytical correlations between self-oriented prospection (CFC and FSC), the proposed mediators (Intergenerational Efficacy and Identification), and the proposed outcome, IGR (scores on the RFG Scale). We estimated these following the guidelines outlined by Goh et al. (2016).

Results suggest that FSC had a small positive association with CFC, IGR, and Efficacy, and a strong positive association with Identification. Notably, CFC had significant and strong positive associations with IGR, Efficacy and Identification. Finally, Efficacy and Identification correlated strongly with each other and with IGR (see Table 5). Thus, although clear causal pathways among these variables remain to be elucidated, we provide the first ever evidence that individual differences in how people think about their own futures positively coincide with their sense of responsibility for safeguarding the lives of other people in the generations to come.

Table 5
Internal meta analyses estimating the average correlation across all studies.

Variable 1	Variable 2	Total N	Meta-correlation
CFC	IGR (RFG Scale)	8608	$r = 0.54$, [0.52, 0.55], Z = 55.42, $p < .001$
CFC	Efficacy	5343	r = 0.52, [0.50, 0.54], Z = 42.04, $p < .001$
CFC	Identification	5343	$r = 0.40$, [0.38, 0.42], Z = 30.82, $p < .001$
FSC	IGR	7212	$r = 0.21$, [0.19, 0.23], Z = 18.27, $p < .001$
FSC	Efficacy	5343	$r = 0.16$, [0.13, 0.19], Z = 11.73, $p < .001$
FSC	Identification	5343	$r = 0.42$, [0.40, 0.44], Z = 32.97, $p < .001$
FSC	CFC	5643	$r = 0.24$, [0.22, 0.27], Z = 18.44, $p < .001$
Efficacy	IGR (RFG Scale)	5343	$r = 0.58$, [0.56, 0.60], Z = 48.34, $p < .001$
Identification	IGR (RFG Scale)	5343	r = 0.54, [0.52, 0.56], Z = 44.00, $p < .001$
Efficacy	Identification	5343	$r = 0.34$, [0.32, 0.36], Z = 25.97, $p < .001$

10. General discussion

The present studies provide evidence that individual differences in self-oriented prospection predict greater other-oriented Intergenerational Responsibility (IGR) for the welfare of forthcoming generations. Specifically, across 10 studies, we demonstrate that Consideration of Future Consequences (CFC) and Future Self-Continuity (FSC)–two separate indicators of self-oriented prospection–consistently correlate positively with IGR. FSC and CFC both independently account for variance in IGR in the bivariate context and uniquely account for variance in IGR when considered simultaneously.

Moreover, both FSC and CFC are related to perceived efficacy in positively impacting future generations and a sense of expansive self-identity including future generations in one's self-concept–two mechanisms proposed in behavioral economics theories on intergenerational resource allocations (e.g., Wade-Benzoni & Tost, 2009). Importantly, we also find that efficacy and identification predict Intergenerational Responsibility. These associations were consistently observed across numerous studies with large sample sizes and validated through an internal meta-analysis, reinforcing the robustness of the findings. These findings also replicate across various measurement formats, such as different scale lengths for the CFC Scale and additional, convergent measures of self-oriented prospection (e.g., Future Time Perspective) and IGR (e.g., Social Generativity, Impartial Intergenerational Beneficence). In summary, our studies reveal that individuals with a stronger sense of continuity with their future *selves* and a greater inclination to consider the consequences of their actions on *their own* future outcomes tend to also exhibit a stronger sense of duty to protect the welfare of future *others*.

Our findings build upon and connect the disparate literatures on cognitive science of prospection and the social psychology of individual differences in Intergenerational Responsibility. Substantial research has been devoted to investigating self-oriented prospection (e.g., Hershfield et al., 2009; Strathman et al., 1994) and its adaptive benefits for planning and achieving positive future life outcomes for individuals. Meanwhile, as concerns about existential threats to future well-being mount across scientific disciplines and society at large (e.g., MacAskill, 2022), recent investigations have abounded into variables that may guide responsibility to future generations (e.g., Law et al., 2024). However, the literature on prospection has yet to directly address the potential adaptive benefits of thinking about one's own future for guiding planning for the future of society. Likewise, the literature on Intergenerational Responsibility has predominantly focused on other-

oriented phenomena (e.g., legacy motivations, moral concern) as candidate moderators of prevailing biases to favor the needs of present over future generations. By drawing upon these disparate literatures and combining their insights with knowledge on perspective-taking across psychological distances from research on Construal Level Theory (Trope & Liberman, 2010), research which shows that moral concern extends outward from the self to more psychologically distant targets (e.g., Crimston et al., 2016), and theorizing from behavioral economics on intergenerational resource allocations (e.g., Wade-Benzoni & Tost, 2009), we show that the same capacities which support the adaptive function of future thinking in personal planning may similarly support planning for brighter collective futures at the societal level. Nonetheless, it's clear that more research is needed to elucidate whether these phenomena relate to one another in the causal sense.

10.1. Implications, limitations and future directions

While this investigation advances our understanding of the relationships between self-oriented prospection and other-oriented Intergenerational Responsibility (IGR), there are noteworthy limitations that call for further investigation in future research. The present studies provide consistent evidence that individuals with higher levels of FSC and CFC tend to feel a stronger sense of IGR. However, the mechanisms underlying the relationships between facets of self-oriented prospection with other-oriented IGR remain largely open and ripe for inquiry. On the one hand, Study 2's cross-sectional findings suggest a potential mediating role of Intergenerational Efficacy and Identification in the consistently observed relationships between self-oriented prospection and IGR. Yet, our attempts to manipulate these predictors and mediators in studies 3a and 3b yielded inconsistent results, raising doubts about their causal roles. While manipulating FSC and CFC increased the intended constructs (as well as IGR in Study 3a), these changes did not lead to increased Identification or Efficacy in Study 3a, nor to heightened IGR in Study 3b, preventing an investigation of indirect paths through the proposed mediators. Additionally, the manipulation of Efficacy in Study 3b resulted in elevated CFC, Identification, and IGR, but, surprisingly not elevated Efficacy, the intended construct. Moreover, the manipulation of Identification in Study 3b did not yield significant changes in any outcomes.

Nevertheless, consistent with prior research linking an expansive sense of identity and efficacy beliefs regarding future impact to pro-future outcomes (Hornsey et al., 2021; Syropoulos, Law, Amormino, & Young, 2024; Syropoulos, Law, & Young, 2024), individual differences in Intergenerational Identification and Efficacy showed consistent positive associations with Intergenerational Responsibility, supporting existing theoretical models proposing these associations (Wade-Benzoni & Tost, 2009). Future research could benefit from employing more robust and focused manipulations of these potential mediators, including ones not examined in our current studies, such as those targeting future-oriented optimism and emotions such as awe. Future research could also explore alternative moderators of the relationship between self-oriented prospection and Intergenerational Responsibility, such as the inclination toward abstract versus concrete processing styles (Eyal et al., 2008) or a greater general tendency for engaging in self-oriented prospection (e.g., future orientation; Ghetti & Coughlin, 2018).

Related to the points above, it is also possible that unmeasured variables related to self-oriented prospection precede both the hypothesized mediators–Intergenerational Efficacy and Identification–and the outcome of Intergenerational Responsibility. Prior research suggests that adopting a concrete construal of others enhances identification (McCrea et al., 2012), and that envisioning the future in vivid, concrete terms predicts greater perceived efficacy in influencing future outcomes (Law et al., 2024). These findings suggest a more complex causal model may be at play, where self-oriented prospection fosters concrete representations of the future, which in turn enhance Intergenerational Efficacy and Identification, ultimately leading to greater responsibility. In sum, better elucidating causal mechanisms and investigating potential moderators could deepen our understanding of why and under what circumstances self-oriented future thinking relates to other-oriented attitudes toward future generations. In turn, these insights may offer practical strategies for motivating individuals to feel a greater sense of responsibility to protect the welfare of those living in the decades, centuries, and even millennia to come.

Another important consideration revolves around the inconsistencies observed in the presence of direct effects within our experimental findings. While our successful manipulations of FSC and CFC yielded direct effects on Intergenerational Responsibility in Study 3a, these effects did not replicate in Study 3b. This discrepancy prompts us to ponder the degree to which experimentally induced augmentations in CFC or FSC can genuinely contribute to an amplified sense of IGR. Although our research unveiled robust associations between FSC and CFC with IGR, Efficacy, and Identification, suggesting the potential for interventions targeting these constructs to promote a sense of duty to safeguard future welfare, our experimental inductions did not uniformly mirror these associations.

Consequently, it is plausible that our experimental inductions, despite their effectiveness in influencing self-report measures of self-oriented prospection, may not fully encapsulate these attributes in the same way they naturally manifest as individual differences. This insight underscores the need for further exploration into the interplay between experimentally induced enhancements and the subtleties of self-oriented prospection as it is naturally experienced. One potential pathway to further elucidate these uncertainties lies in the realm of longitudinal research, particularly employing designs that incorporate manipulations capable of fostering more enduring impacts on Future Self-Continuity (FSC) and Consideration of Future Consequences (CFC), such as semester length or online courses involving repeated exposures and measurements. Another potential pathway is to use more immersive manipulations (e.g., Hershfield et al., 2009, 2018) that more comprehensively induce self-oriented prospection, such as engaging participants in virtual reality visualizations of their future selves to cultivate greater vividness and affective signal in subjects' representations of the future (e.g., Ganschow et al., 2021). Nevertheless, by shedding novel light on the complex nature of prospection and its *potential* adaptive benefits for cultivating Intergenerational Responsibility, we hope to inspire further research that can ultimately further explicate the finer-grained nuances which govern these connections. And, if further experimental efforts provide stronger evidence that self-oriented prospection and intergenerational responsibility are *causally* related, more enduring and immersive manipulations–like those discussed above–may offer practical utility as interventions to facilitate planning and achievement at the levels of individuals and society alike.

Our findings align with recent research linking individual differences in future-thinking abilities to pro-future attitudes and behaviors, suggesting a possible common cognitive basis for considering both personal and collective futures. Studies show that the ability to vividly imagine distant futures is associated with moral consideration and prosocial intentions toward future generations (Law et al., 2024) and distant individuals more broadly (O'Connor & Fowler, 2023). Earlier research also links FSC and CFC to the ability to vividly imagine hypothetical futures (Rebetez et al., 2016; Stephan et al., 2018). Combining these insights with our findings, which highlight relationships between FSC and CFC with IGR, suggests a potential shared cognitive framework underpinning envisioning both personal and collective futures. Future research should address cognitive and neural overlap between self- and other-oriented prospection to explore these similarities more deeply. Indeed, some research in this vein has already begun. Namely, research in prospection is beginning to explore the contours of collective future-thinking–how people imagine the futures of the collectives to which they belong (e.g., social groups, countries, society as a whole; Mert et al., 2023; Topcu & Hirst, 2022).

Yet another direction future research might explore is whether the

patterns observed in the present findings could operate in the opposite direction of our current conceptualization. While we were primarily interested in whether garnering heightened self-oriented prospection could in turn influence greater other-oriented IGR, the inverse pattern is equally plausible. That is, cultivating responsibility for future generations could have downstream consequences for how people think about and in turn plan for their own futures. Future investigations may examine this inverse pathway by manipulating IGR rather than self-oriented prospection. Importantly, forthcoming efforts in this vein could further seek to elucidate potential shared benefits of protecting our individual and collective futures by examining as well whether causal pathways may be reciprocal in nature.

Finally, although the sample sizes employed in the present studies were large ($N_{Total} = 9570$), all of the subjects lived in the United States and existed in the present day. Thus, it is unclear whether and how the observed results will translate across international boundaries, cultures, and time. Ongoing and future research may look to address potential cultural and societal influences on the observed effects (see Ji et al., 2021), as well as whether the same patterns observed here will replicate or perhaps even be more pronounced in the future, when existential threats facing humanity may be all the more salient.

11. Conclusion

In conclusion, we provide new insights into the connection between self-oriented prospection and other-oriented Intergenerational Responsibility (IGR), helping bridge the gap between these largely disparate literatures. The consistent associations between Future Self-Continuity (FSC), Consideration of Future Consequences (CFC), and IGR, along with Intergenerational Efficacy and Identification, highlight the importance of these constructs in ethical decision-making across generations. These findings leave numerous questions open, particularly with respect to whether and how these phenomena are *causally* related, inviting further exploration of the link between self- and other-oriented prospection and into strategies for fostering responsible consideration of future generations.

CRediT authorship contribution statement

Kyle Fiore Law: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Project administration, Methodology, Investigation, Conceptualization. **Stylianos Syropoulos:** Writing – review & editing, Writing – original draft, Visualization, Validation, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Matthew Coleman:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Data curation, Conceptualization. **Liane Young:** Writing – review & editing, Validation, Supervision, Software, Resources, Funding acquisition.

Declaration of competing interest

None*.

*The authors have no competing interests to disclose.

Data availability

All data and code are available on the Open Science Foundation website: https://osf.io/preprints/psyarxiv/29jeb.

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Appendix A. Supplementary data

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