Intergenerational Solidarity -

A Study of Psychological Predictors of Macro-Level Intergenerational Solidarity Within Specific Crises and Crisis-Overarching, in Different Generational Directions, and Across Different Cultures

Thesis
for the degree of

doctor rerum naturalium (Dr. rer. nat.)

approved by the Faculty of Natural Sciences of Otto von Guericke University Magdeburg

by M.Sc. Theresa Sieverding

born on November 23rd 1993 in Berlin, Germany

Examiner: Prof. Dr. Ellen Matthies

Prof. Dr. Lennelis Kruse

submitted on: June 12th 2024

defended on: February 19th 2025

Table of Contents

Abstract

Many large-scale crises are characterized by intergenerational dynamics. In the COVID-19 pandemic, for example, older people were among the most affected in terms of health. In the climate crisis and other environmental crises, it is the young and future generations that will be among the most affected. More affected generations often depend on less affected generations to mitigate the respective crisis on their behalf, i.e., to act in *intergenerational solidarity*. The aim of this dissertation was to identify predictors of macro-level intergenerational solidarity in specific crises (COVID-19 pandemic and climate crisis) and crises-overarching, as well as in different generational directions and socio-cultural contexts. To this end, I drew on variables that have successfully explained intergroup and intergenerational prosociality in the past, namely intergroup contact, social identification and affinity, and legacy motivation, and applied them to the intergenerational context. I examined whether intergenerational contact (RQ1), social closeness between generations conceptualized as social identification and affinity (RQ2), and legacy motivation (RQ3) were predictive of macro-level intergenerational solidarity. Four online survey studies were conducted and published in three papers. Study 1 examined COVID-19 containment behavior and support for COVID-19 containment measures (crisis-specific solidarity with older people) of young people (N = 258 16-to-30-year-olds) and used a correlative design to test RQ1 and RQ2. Study 2 examined crisis-overarching intergenerational political solidarity among older people (56- to 87-/ 88-year-olds) in three countries (USA: N = 399; Germany: N = 401; Brazil: N = 403) and used a correlative design to test RQ1, RQ2, and RQ3. Study 3 examined climate protection behavior and intentions (crisis-specific solidarity with younger and future generations) of older people (N = 411, 55-to-75-year-olds) and used a correlative design to test RQ1, RQ2, and RQ3. Study 4 examined climate protection intentions (crisis-specific solidarity with younger and future generations) of older people (N = 309 55-to-86-year-olds) and experimentally tested RQ2. In summary, the results indicate that intergenerational contact and especially its quality are relevant predictors of intergenerational solidarity. Intergenerational affinity, but not a general intergenerational identification, emerged as significant predictors of intergenerational solidarity. Furthermore, the motivation to leave a positive legacy emerged as a predictor of intergenerational solidarity. These mechanisms were found to be both crisis-specific and crisis-overarching, suggesting that the model could be applied to different crises and contexts. In addition, the model was validated in three countries that differ in variables such as demographics, language, and culture, suggesting that the postulated mechanisms can be applied to different socio-cultural backgrounds.

Zusammenfassung

Viele großskalige Krisen sind durch generationenübergreifende Dynamiken gekennzeichnet. Bei der COVID-19-Pandemie beispielsweise gehörten ältere Menschen zu den gesundheitlich am stärksten Betroffenen. In der Klimakrise und anderen Umweltkrisen sind es die jungen und künftigen Generationen, die am stärksten betroffen sein werden. Die stärker betroffenen Generationen sind oft darauf angewiesen, dass die weniger betroffenen Generationen die jeweilige Krise für sie mitigieren d.h. dass sie in *intergenerationeller Solidarität* handeln. Ziel dieser Dissertation war es, Prädiktoren für die intergenerationelle Solidarität auf Makroebene in spezifischen Krisen (COVID-19-Pandemie und Klimakrise) und krisenübergreifend sowie in verschiedenen generationellen Richtungen und soziokulturellen Kontexten zu identifizieren. Zu diesem Zweck griff ich auf Variablen zurück, die in der Vergangenheit erfolgreich die Prosozialität zwischen Gruppen und zwischen Generationen erklärt haben, nämlich den Kontakt zwischen den Gruppen, die soziale Identifikation und Affinität sowie die Vermächtnismotivation, und wandte sie auf den intergenerationalen Kontext an. Ich untersuchte, ob der Kontakt zwischen den Generationen (F1), die soziale Nähe zwischen den Generationen, konzeptualisiert als soziale Identifikation und Affinität (F2), und die Vermächtnismotivation (F3) die intergenerationelle Solidarität auf Makroebene vorhersagen können. Es wurden vier Online-Befragungsstudien durchgeführt und in drei Publikationen veröffentlicht. Studie 1 untersuchte das COVID-19-Eindämmungsverhalten und die Unterstützung für COVID-19-Eindämmungsmaßnahmen (krisenspezifische Solidarität mit älteren Personen) von jungen Personen (N = 258 16- bis 30-Jährige) und verwendete ein korrelatives Design, um F1 und F2 zu testen. Studie 2 untersuchte krisenübergreifende intergenerationelle politische Solidarität von älteren Personen (56- bis 87-/ 88-Jährige) in drei Ländern (USA: N = 399; Deutschland: N = 401; Brasilien: N = 403) und nutzte ein korrelatives Design, um RQ1, RQ2 und RQ3 zu testen. Studie 3 untersuchte Klimaschutzverhalten und -intentionen (krisenspezifische Solidarität mit jüngeren und zukünftigen Generationen) älterer Personen (N = 411 55- bis 75-Jährige) und nutzte ein korrelatives Design, um F1, F2 und F3 zu testen. Studie 4 untersuchte die Klimaschutzintentionen (krisenspezifische Solidarität mit jüngeren und zukünftigen Generationen) älterer Personen (N = 309 55- bis 86-Jährige) und testete F2 experimentell. Zusammenfassend deuten die Ergebnisse darauf hin, dass der intergenerationelle Kontakt, und insbesondere dessen Qualität, ein relevanter Prädiktor für intergenerationelle Solidarität sind. Intergenerationelle Affinität, nicht aber eine allgemeine intergenerationelle Identifikation, erwies sich als signifikanter Prädiktor für generationenübergreifende Solidarität. Darüber hinaus erwies sich die Motivation, ein positives Vermächtnis zu hinterlassen, als ein Prädiktor für die intergenerationelle Solidarität. Diese Mechanismen erwiesen sich sowohl als krisenspezifisch als auch als krisenübergreifend, was darauf hindeutet, dass das Modell auf verschiedene Krisen und Kontexte angewendet werden kann. Darüber hinaus wurde das Modell in drei Ländern validiert, die sich in Bezug auf Variablen wie Demografie, Sprache und Kultur unterscheiden, was darauf hindeutet, dass die postulierten Mechanismen auf verschiedene soziokulturelle Hintergründe angewendet werden können.

1. Thematical Introduction and Overall Research Objective

1.1 Intergenerational Dynamics of Large-Scale Crises

Many of the large-scale crises that societies are facing are characterized by intergenerational dynamics. The generation to which one belongs to can influence how much one is affected by, how much one contributes to, and how well one can cope with certain crises (Elliott, 2022). These intergenerational dynamics can be observed, for example, in the receding COVID-19 pandemic and the looming climate crisis.

In the COVID-19 pandemic, older adults were among the most vulnerable as they were more likely to experience higher risks of serious and fatal COVID-19 progression (see, e.g., Robert Koch Institut, 2021a). Young people suffered on average more from the social and economic consequences grounded in the COVID-19 containment measures, e.g., from loneliness and job insecurity, than from physical health risks related to a potential infection with the virus (Eurofound, 2020). Therefore, COVID-19 containment behaviors were on average associated with fewer benefits and higher social and economic costs for young people (Jin et al., 2021; Lytle et al., 2020). Particularly at the offset of the pandemic when there was no vaccine available, young people were asked to behave in a COVID-19 containing manner in order to protect older and other vulnerable groups from an infection. This was especially the case since young people exhibited on average less symptoms when infected and could therefore unknowingly act as superspreaders.

Intergenerational dynamics also are very evident in most environmental crises. When compared to the COVID-19 pandemic, the intergenerational dynamics of environmental crises, such as the climate crisis, environmental degradation, and pollution, are reversed, and young and future generations will be among the most affected. In the climate crisis, today's younger and future generations are more likely to experience its adverse consequences, such as extreme weather events and water scarcity, than today's older generations (IPCC, 2023b). However, even though younger generations will be among the groups most affected by the future impacts of the climate crisis, they have relatively little say in political decisions to mitigate the climate crisis (Hartmann, 2021; IPCC, 2022). Older generations, who are less likely to experience the negative impacts of the climate crisis, are on the other hand more numerous in the electorate and occupy most of the critical positions in politics and business (Hartmann, 2021). They also have the highest per capita carbon emissions by age, therefore contribute relatively more to the climate crisis (Zagheni, 2011). In the climate crisis, older generations are therefore called upon

to act in a way that protects the climate for the benefit of younger and future generations, even though they themselves will benefit less from these actions.

Both the COVID-19 pandemic and the climate crisis illustrate that the affiliation to a certain generation can influence the extent to which one is affected by a particular crisis. In the case of the climate crisis and many other environmental crises, generational affiliation also determines the contribution and mitigation power (Elliott, 2022). The effect of generational affiliation on affectedness and on contribution and mitigation power is often inverse, with more affected generations contributing less and having less mitigation power in large-scale crises. In order to be able to successfully cope with the respective crisis, more affected generations often depend on less affected, potentially more responsible and powerful, generations, to mitigate the respective crisis, at least in part, on their behalf, even though these less affected generations have less self-interest in doing so.

1.2 Crisis Mitigation as Solidarity in a Social Dilemma

The decision whether or not to mitigate a crisis (e.g., to mitigate the climate crisis) represents a *social dilemma*. A social dilemma is a situation where individual and collective interests are in conflict and one has to decide whether or not to bear personal costs and forego personal benefits for the sake of a long-term common good (e.g., a healthy future climate; Van Lange et al., 2013). There are two types of social dilemma situations, depending on whether or not one is part of the collective that benefits from the common good (Bierhoff & Küpper, 1999). In the first type of a social dilemma situation, one is part of the collective whose interest is at stake, e.g., one is part of a generation that would benefit strongly from a future healthy climate. In the second type of a social dilemma situation, one is not part of the collective that benefits from the common good that is worked towards. This would be the case, for example, for elderly people who will not reap the benefits of climate crisis mitigation because they will not live to see the climate of the future.

In both social dilemma types, the individual can decide to forego personal benefits, bear personal costs, and cooperate with others to contribute to the common good. This joint form of cooperation is called *solidarity*, and refers to a society-level support of groups (Bierhoff & Küpper, 1999; Smith, 2019). If solidarity has the goal of contributing to a common good that one benefits from, it is referred to as *solidarity formed on the basis of common interests*. This form of solidarity is to some extent egoistically motivated (Batson, 1994) as it has the goal to improve one's own fate (Bierhoff & Küpper, 1999). In contrast, if solidarity aims at contributing to a common good that one does *not* benefit from, it is referred to as *solidarity based on interests*

of others. Mitigating a crisis primarily on behalf of another, more affected generation (e.g., young people adhering to COVID-19 regulations and older people protecting the climate), would fall under this second, other-oriented form of solidarity. As the collective that primarily benefits from this solidarity is another generation, this is also a form of *intergenerational solidarity*.

Whereas Bierhoff and Küpper (1999) distinguish between solidarity based on common or other's interests, solidarity in the intergenerational context is mainly categorized into intergenerational solidarity at the micro level, hence among families and individuals (Bengtson & Oyama, 2010), and intergenerational solidarity at the macro level, hence within society and between different groups (e.g., the youth, the elderly; Ryder, 1965). Mitigating a crisis primarily on behalf of another more affected generation would fall into the second category, i.e., *intergenerational solidarity at the macro level*.

1.3 Research Objective: Psychological Prediction of Intergenerational Solidarity at the Macro Level

As discussed in Section 1.1., there is a variety of large-scale crises that are characterized by intergenerational dynamics and that require intergenerational solidarity at the macro level to protect more affected and vulnerable generations. In recent years, particularly in the context of the COVID-19 pandemic and the climate crisis, the intergenerational dynamics of large-scale crises have become more prominent in public discourse, accompanied by calls for more intergenerational solidarity (Führer, 2021; Geyer, 2021). Yet, psychological research on macro-level intergenerational solidarity is scarce.

My research objective was to develop and test a psychological model that could explain intergenerational solidarity at a macro level both as an overarching concept, as well as within specific large-scale crises. My main interest surrounded large-scale environmental crises and the climate crisis in particular, and thus solidarity from older toward younger and future generations. Despite this, I wanted to develop a model that could explain intergenerational solidarity in different generational directions, and the COVID-19 pandemic offered a valuable opportunity to study solidarity from younger toward older generations. Furthermore, I aimed at developing and testing a model that could explain intergenerational solidarity in a variety of socio-cultural contexts, as many large-scale crises are international in nature, and country-specific socio-cultural and environmental factors shape the crisis impacts, contributions, and mitigation options.

2. Theoretical Background and Research Questions

There has so far been little psychological research on what might motivate less affected generations to behave in solidarity with other generations. Most psychological research studies intergenerational solidarity at a micro level, hence among individuals and families (Bengtson & Oyama, 2010; Bengtson & Robert, 1991). Only few studies have examined the psychological predictors of macro-level intergenerational solidarity. And even fewer studies have examined possible predictors that are specific to the intergenerational context, such as perceived responsibility toward future generations (Fairbrother et al., 2020; Syropoulos & Markowitz, 2021b). However, there is a large body of research on facilitators of related behaviors that can be drawn upon. Numerous studies have examined barriers and motivators of prosocial behavior, which can be understood as a more specific form of intentional and voluntary act that potentially or actually benefits a recipient (Eisenberg & Miller, 1987), and which is sometimes considered as one form of solidarity (Bierhoff & Küpper, 1999; Kastner, 2021).

2.1 Barrier to Prosocial Behavior: Psychological Distance

A key barrier to prosocial behavior is the psychological distance, which refers to the degree to which a person feels removed from a phenomenon, e.g., a person or a time (Trope & Liberman, 2003). Because the benefits of prosocial behavior accrue to someone else (which creates a social distance), they are less immediate to the acting person and are therefore discounted, making prosocial behavior less likely. In addition, the benefits of prosocial behavior may only occur in the future (e.g., the effects of climate crisis mitigation), which leads to an additional temporal distance, which in turn makes prosocial behavior even less likely (Wade-Benzoni & Plunkett Tost, 2009).

To develop a model predicting intergenerational solidarity at a macro level, I therefore drew on variables that have in the past successfully promoted intergroup and intergenerational prosociality by reducing the social distance toward the recipients and the temporal distance toward the benefits of the prosocial behavior. In particular, I reviewed the variables of intergroup contact, social identity and affinity, and legacy motivation for their potential to explain intergenerational solidarity.

2.2 Facilitator of Intergroup Prosocial Behavior: Intergroup Contact

One prominent way to reduce social distance and thereby improve intergroup relations and behaviors is through intergroup contact. Allport's (1954) contact hypothesis states that, under optimal conditions, intergroup contact can reduce prejudice and improve intergroup

attitudes. In a meta-analytic test of the theory, Pettigrew and Tropp (2006a) found intergroup contact to reduce intergroup prejudice and that this effect typically generalized beyond participants in the immediate contact situation. Several studies provide evidence that intergroup contact does not only reduce prejudice, but also increases prosociality between groups, e.g., outgroup helping behavior (Johnston & Glasford, 2018), political action intentions on behalf of an outgroup (Glasford, 2013), outgroup-directed prosocial behaviors (Koschate et al., 2012), and willingness to work in solidarity (Hässler et al., 2020).

Researchers generally agree that the quality of intergroup contact is more important than its quantity for improving intergroup attitudes and behaviors (e.g., Islam & Hewstone, 1993). While some studies show a positive (albeit smaller) effect of quantity of contact on intergroup attitudes and behaviors (see, e.g., Brown et al., 2007; De Coninck et al., 2021; Islam & Hewstone, 1993), others found no effect of quantity on, for example, helping behavior toward the outgroup (e.g., Johnston & Glasford, 2018; Schwartz & Simmons, 2001).

Similar evidence was found in the intergenerational context. In their meta-analytic study of the contact hypothesis, Pettigrew and Tropp (2006a) found contact with older adults to consistently reduce prejudice toward them. Kwong and Yan (2021) reported that high-quality intergenerational contact led to improved attitudes of young adults toward older people and that these improved attitudes resulted in more prosocial behavior intentions. Accordingly, Bousfield and Hutchison's (2010) cross-sectional study showed that quality of intergenerational contact was positively associated with young people's attitudes and behavioral intentions (e.g., to help in a situation of need) toward older people.

Despite this wealth of research on the beneficial effect of intergroup contact, there is a lack of research on the potential effects of intergenerational contact on macro-level intergenerational solidarity, e.g., crisis mitigation behalf on behalf of other generations. Thus, I derived the following research question (see Figure 1 for an overview of all postulated research questions and central variables):

Research Question 1: Does intergenerational contact predict intergenerational solidarity?

2.3 Facilitator of Intergroup Prosocial Behavior: Social Closeness

Intergroup contact improves intergroup attitudes and behaviors by reducing the social distance and thus increasing the social closeness between the groups. This is reflected, among other things, in a greater sense of shared identity (Turner et al., 2008), and an increase of perspective taking and empathy with members of the other group (see Pettigrew & Tropp, 2008 for a meta-analysis). In the following section, I review the variables of social identification and

affinity (which combines *perspective taking*, *empathy*, and *perceived oneness*) as potential predictors and mediators of the relationship between intergenerational contact and intergenerational solidarity.

2.3.1 Social Identification as a Conceptualization of Social Closeness and a Facilitator of Intergroup Prosociality

Social identification refers to the identification with a social category or social group (Tajfel & Turner, 2004). Social groups are formed based on feelings of proximity, similarity, or shared fate. People within one's social group are said to be met with more positive beliefs, feelings, and behaviors (ingroup favoritism). People possess many different group identities and are capable of focusing on different social categories. Modifying the ways in which the self and others are categorized can therefore be an important way for improving intergroup relations and behaviors and promote intergroup prosociality. Intergroup contact can induce members of different groups to perceive themselves as a single, more inclusive superordinate group rather than as two separate groups. As a result, ingroup favoritism and associated positive beliefs, feelings, and behaviors are said to be redirected toward former outgroup members (Gaertner & Dovidio, 2014).

Accordingly, in the context of the COVID-19 pandemic, the perception of a global common fate and a resulting identification with all humanity (in lieu of a more narrow national identification) yielded more outgroup helping (Zagefka, 2021). Römpke et al. (2019) found evidence that an identification with humanity, fostered by international contact, was positively related to intentions of global responsible behaviors such as resource conservation. Correspondingly, results from cross-cultural studies by Van Zomeren et al. (2011) revealed that identifying with members of an ethnic minority from one's country of residence who are victims of social inequality predicted collective action amongst the non-affected majority group.

In the intergenerational context, Cadieux et al. (2019) provided first empirical evidence showing that young adults who reported a higher cognitive overlap between themselves and older adults, elicited by high-quality intergenerational contact, perceived older adults as more competent and expressed more positive attitudes toward them. Yet, to date, there has been no empirical research on how identification across generations is related to prosocial and solidarity between generations, although several researchers assume a positive relationship (Fritsche et al., 2018; Wade-Benzoni, 2003).

2.3.2 Affinity as a Conceptualization of Social Closeness and a Facilitator of Intergroup Prosociality

Alongside increasing the perception of a shared social identity, intergroup contact does also improve intergroup attitudes and behaviors through an increase in perspective taking ("cognitive capacity to draw inferences about other peoples' beliefs, intentions and thoughts"; Singer & Klimecki, 2014, p. R875) and empathy ("capacity to resonate with others' emotional states"; Singer & Klimecki, 2014, p. R875; see Pettigrew and Tropp, 2008, for a meta-analysis). Wade-Benzoni (2008) combines the variable of perceived oneness (or perceived self-other overlap, the extent to which an individual perceives someone else as a part of him or herself; Aron et al., 1992), which is closely related to a shared social identity, with the variables perspective taking and empathy under the concept of affinity (see Wade-Benzoni, 2003 for a classification of the variables of identification and affinity). It should be noted that while she combined the three variables into one superordinate variable, other scholars have explicitly examined their interrelationships and generally found a causal effect of perspective taking on both empathy and perceived oneness(Batson & Ahmad, 2009; Coke et al., 1978; Galinsky & Moskowitz, 2000; Pagotto, 2010).

Wade-Benzoni (2008) posits that when an individual feels affinity with and thus closer to another person, that person's interests are assumed to be aligned more with the individuals' self-interests. In turn, social distance is said to decrease and the likelihood of prosocial behavior is said to increase (Wade-Benzoni, 2019; Wade-Benzoni & Plunkett Tost, 2009). This assumption is supported by results from two experimental studies on intergenerational decision-making (Wade-Benzoni, 2008). Results show that the more affinity decision makers expressed for future generations, the more willing they were to forego some of their personal benefits in a resource allocation scenario and the higher their acceptance of an increase in taxes for the benefit of these future generations. In addition, there are numerous findings on the individual effects of the three subfacets of affinity on intergroup prosociality, e.g., on prosocial behavior toward outgroup members (Batson et al., 2002; Koschate et al., 2012; Taylor & Glen, 2020).

However, the effects of the three subfacets of affinity on prosociality are rarely studied in the intergenerational context, and there exist only few studies on the role of the superordinate variable of affinity on prosocial behaviors, both in general as well as in the intergenerational context. I therefore examined the predicting and mediating role of affinity as a superordinate variable for intergenerational solidarity at the macro level. Based on the presented theoretical

and empirical research background on the role of shared social identity and affinity for intergroup and intergenerational prosociality, I formulated the following research questions:

Research Question 2.1: Does intergenerational closeness, conceptualized as intergenerational identification and intergenerational affinity, predict intergenerational solidarity?
Research Question 2.2: Does intergenerational closeness, conceptualized as intergenerational identification and intergenerational affinity, mediate the relationship between intergenerational contact and intergenerational solidarity?

2.4 Facilitator of Intergenerational Prosocial Behavior: Legacy Motivation

One promising way to reduce both the social and temporal distances inherent in decisions that affect future others is to appeal to and increase one's legacy motivation. Legacy refers to the enduring meaning attached to one's identity and to the impact that one has on others beyond the temporal constraints of the life span (Wade-Benzoni & Plunkett Tost, 2009). Accordingly, legacy motivation refers to the desire to have an impact that will last beyond one's lifetime (Hurlstone et al., 2020; Wade-Benzoni, 2019). Legacy motivation is assumed to make the consequences of one's behavior for future others more immediate and relevant to oneself (hence less psychologically distant).

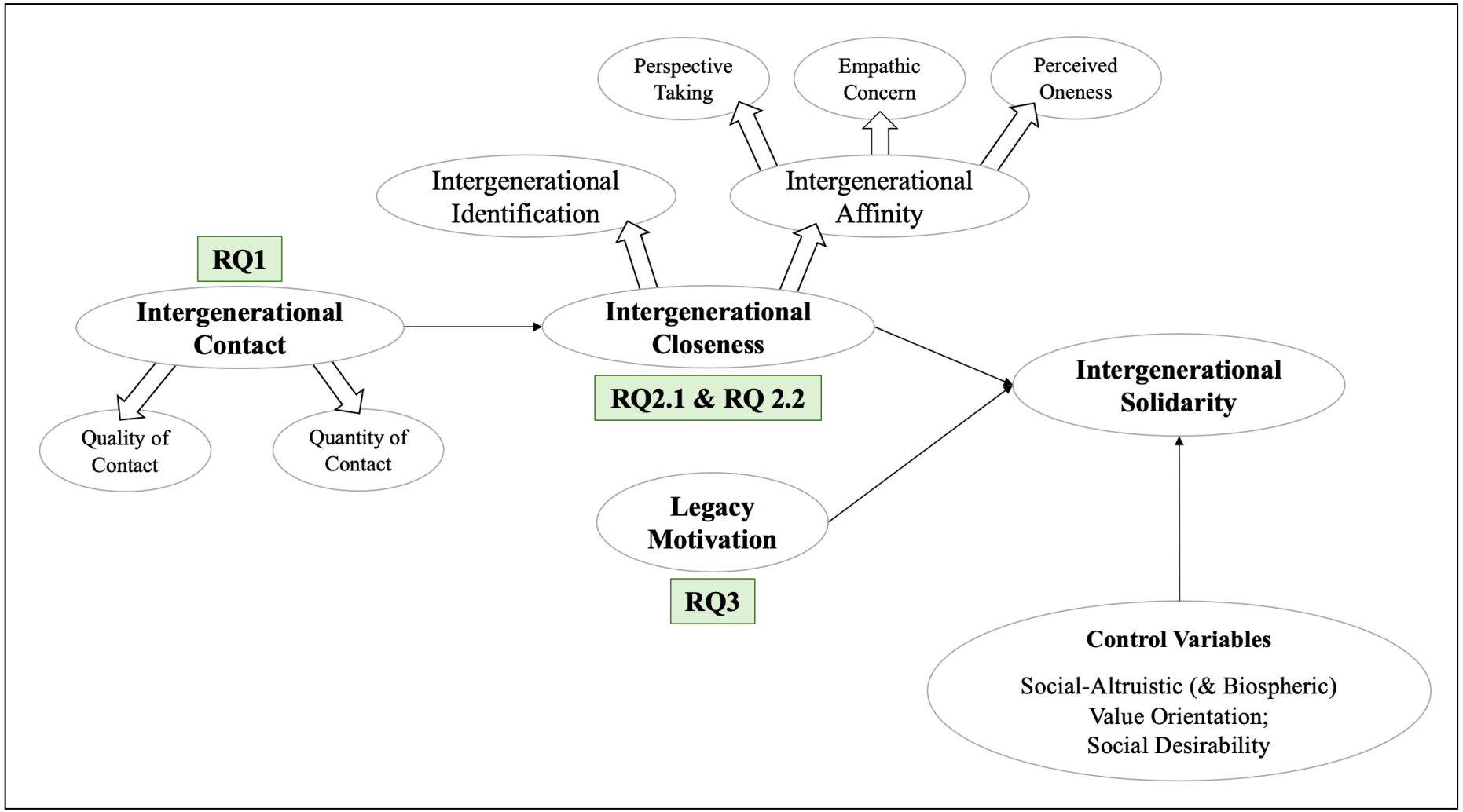
Various experimental studies demonstrate the important role of legacy motivation for intergenerational beneficial behavior, e.g., regarding money allocation (Bang et al., 2017) or the allocation of natural resources (Wade-Benzoni et al., 2010) to future generations. The role of legacy motivation is often studied in environmental contexts, as environmental protection can be viewed as an act for future generations (Zaval et al., 2015). Zaval et al. (2015) confirmed the relationship between legacy motivation and pro-environmental beliefs, intentions, and behavior. They furthermore primed participants' legacy motivation through an essay-writing task and discovered positive effects of legacy motivation on pro-environmental beliefs, intentions, and behaviors. Accordingly, activating the legacy motivation (e.g., by promoting death awareness) has been shown to reduce intergenerational discounting, leading to increased intergenerational cooperation in a climate change public goods game (Hurlstone et al., 2020).

To contribute to this growing body of empirical research on the role of legacy motivation for intergenerational prosocial behavior and to extend its application to crisis-specific and crisis-overarching intergenerational solidarity, I derived the following research question.

Research Question 3: Does legacy motivation predict intergenerational solidarity?

Figure 1

Overview of the Four Research Questions and Central Variables of the Present Dissertation



3. Overview of the Empirical Studies of the Present Dissertation

To examine macro-level intergenerational solidarity in specific crises and crisis-overarching, in different generational directions, and across different socio-cultural contexts and to examine the presented research questions, four empirical studies were carried out and published in three publications (A-C). See Table 1 for more details on research questions examined, study designs, data collection, sample characteristics, assessed variables, and statistical methods used in the four studies.

Study 1 (Publication A) investigated younger people's crisis-specific intergenerational solidarity with older people, conceptualized as COVID-19 containing behavior and support of COVID-19 containment measures and examined RQ1, RQ2.1 and RQ2.2 using a correlative design. Data was collected via an online survey in a German convenience sample.

Study 2 (Publication B) investigated older people's intergenerational political solidarity, thus a crisis-overarching intergenerational solidarity, with younger people. RQ1, RQ2.1 and RQ2.2 were examined using a correlative design. To test the postulated model across a variety of cultures, this second study took a cross-cultural approach. I chose three countries that differ in their sociodemographic, cultural (relating to Hofstede's cultural dimensions, e.g., long term orientation, individualism, indulgence; The Culture Factor Group, 2024), economic, and environmental backgrounds, namely Germany, the United States, and Brazil. The survey was carried out online, data was provided by an internet panel provider and was representative for each country.

Study 3 (Publication C) investigated older people's climate crisis mitigation intentions and behavior (crisis-specific intergenerational solidarity with younger and future generations) and examined RQ1, RQ2.1, RQ2.2, and RQ3 using a correlative design. Data was collected via an online survey in a sample representative for Germany provided by an internet panel provider.

Study 4 (Publication C) investigated older people's climate crisis mitigation intentions (crisis-specific intergenerational solidarity with younger and future generations) and examined RQ2.1 and RQ2.2 using an experimental design by manipulating participants' perspective taking with younger people through a text reading intervention. Data was collected via an online survey in a sample representative for Germany provided by an internet panel provider.

Table 1

Overview of the Research Questions and Methodology of the Three Publications of the Cumulative Dissertation

Publication and study	**Publication A** **Study 1** (Sieverding & Wallis, 2022)	**Publication B** **Study 2** (de Paula Sieverding, Merten, & Kastner, 2023)	**Publication C** **Studies 3 and 4** (de Paula Sieverding, Kulcar, & Schmidt, 2024)
Research questions examined	RQ1, RQ21, & RQ2.2	RQ1, RQ2.1, RQ2.2, & RQ3	Study 3: RQ1, RQ2.1, RQ2.2, & RQ3 Study 4: RQ1, RQ2.1, & RQ2.2
Study design	Correlational	Correlational	Studies 3 & 4: Correlational Study 4: Experimental
Data collection	Online survey study	Cross-cultural online survey study	Two online survey studies
Sample	Convenience sample N = 258 16- to 30-year-old Germans	Samples representative for age, gender, partly for education N_{GER} = 401 55- to 87-year-olds N_{USA} = 399 55- to 88-year-olds N_{BRA} = 403 55- to 87-year-olds	Samples representative for age, gender, and education N_{Study3} = 411 55- to 75-year-old Germans N_{Study4} = 309 55- to 86-year-old Germans
Independent variables	Intergenerational contact; General identification with older adults	Quality and quantity of intergenerational contact; Intergenerational affinity; Legacy motivation	Study 3: Quality and quantity of intergenerational contact; Intergenerational affinity; Legacy motivation Study 4: Quality and quantity of intergenerational contact;

			Intergenerational perspective taking, empathic concern, perceived oneness
Dependent variables	COVID-19 containment behaviors Support of COVID-19 containment measures	Intergenerational political solidarity	Study 3: Climate crisis mitigation intentions and behavior Study 4: Climate crisis mitigation intentions
Statistical methods	Structural Equation Modelling	Multigroup Confirmatory Factor Analysis Structural Equation Modelling	Structural Equation Modelling ANCOVA

Note. GER = Germany; USA = United States of America; BRA = Brazil.

4. The Three Publications of the Present Dissertation

In the following, the three publications that are part of this cumulative dissertation are presented. Each publication is accompanied by information about the journal scope and personal contribution. To preserve the formatting of the original publications, I have retained the formatting of tables and statistical parameters as required by the respective journal's guidelines.

The present dissertation consisted of the following publications:

Publication A:

Sieverding, T., & Wallis, H. (2022). Young for Old — COVID-19 Related Intergenerational Prosocial Behavior. *Journal of Intergenerational Relationships*, *22*(1), 121-142. https://doi.org/10.1080/15350770.2022.2156651

Publication B:

de Paula Sieverding, T., Merten, M., & Kastner, K. (2023). Old for young: Cross-national examination of intergenerational political solidarity. *Group Processes & Intergroup Relations*, *0*(0) 13684302231201785. https://doi.org/10.1177/13684302231201785

Publication C:

de Paula Sieverding, T., Kulcar, V. & Schmidt, K. (2024). Act like There Is a Tomorrow — Contact and Affinity with Younger People and Legacy Motivation as Predictors of Climate Protection among Older People. *Sustainability,* *16*(4)*,* 1477. https://doi.org/10.3390/su16041477

Publication A: Young for Old - COVID-19 Related Intergenerational Prosocial Behavior

Sieverding, T., & Wallis, H. (2022). Young for Old — COVID-19 Related Intergenerational Prosocial Behavior. *Journal of Intergenerational Relationships*, *22*(1), 121-142. https://doi.org/10.1080/15350770.2022.2156651

Abstract

Older adults were among the high-risk groups for COVID-19 infection and relied on less vulnerable groups to protect them. In Spring 2021, we examined potential intergenerational motivators of COVID-19 containing behaviors and the support of COVID-19 containment measures among young Germans ($N = 258$). Intergenerational contact and general identification with older adults were not associated with COVID-19 containing behaviors or support of COVID-19 containment measures. However, the awareness of older adults' vulnerability to COVID-19 and the identification with older adults based on the shared experience of the pandemic were positive predictors of both criteria.

Keywords: COVID-19, prosocial behavior, vulnerable groups, intergenerational relationships, behavior in crises

1. Introduction

Behaviors required to overcome large-scale crises, such as the climate crisis or the COVID-19 pandemic, often represent a social dilemma. A social dilemma is a situation in which individuals need to forgo personal short-term benefits and bear personal costs for a long-term and collective goal (Van Lange et al., 2013). Many of the COVID-19 mitigation behaviors, such as social distancing or the support of restrictive policies, represent a trade-off between self and other interests and thus a prosocial behavior choice (Jin et al., 2021; Romano et al., 2021).

The costs and benefits of these prosocial COVID-19 mitigation behaviors vary across social groups, e.g., across different generations. At the beginning of the pandemic, older adults were considered to be particularly vulnerable because they were more likely to experience higher risks of serious and fatal COVID-19 progression compared to young people (see, e.g., Robert Koch Institut, 2021a). Evidence suggested that young people suffered more from the social and economic consequences grounded in the COVID-19 containment measures, e.g., from loneliness and job insecurity, than from physical health risks related to a potential infection with the virus (Eurofound, 2020). Jin et al. (2021) provided empirical evidence from 56 societies and found that age was positively associated with higher perceived costs of contracting the virus and negatively with perceived costs in daily life, loneliness, and job insecurity. Young people were thus faced with higher perceived costs and fewer perceived benefits of containing behaviors (Jin et al., 2021). Consequently, COVID-19 mitigation behaviors represented a particularly prosocial behavior choice for young adults. Especially in the first year of the pandemic (2020), with no vaccine availability, vulnerable groups, including older people, depended on young people to act prosocially by accepting restrictive COVID-19 containment measures and modifying behavior in ways to reduce the spread of the virus (see, e.g., Lytle et al., 2020). This was of special importance because young adults showed, on average, less symptoms when infected and could unknowingly spread the virus (see, e.g., Furuse et al., 2020).

These intergenerational dimensions have been widely discussed since the beginning of the pandemic (see, e.g., Renner, 2021). Numerous studies have examined COVID-19 containing behavior as a prosocial behavior (Radic et al., 2021; Rudert & Janke, 2021). However, only a few examined the intergenerational features of COVID-19 containing behaviors (Vale et al., 2020), and the specific motivators of prosociality between generations.

We are aware that young people were also in need of support from other generations in the pandemic, particularly with financial ramifications. However, in the first year of the

pandemic, the focus was not on its second-order consequences, but on the containment of the spread of the virus and protection of the health of vulnerable populations.

For this reason, we seek to provide empirical evidence of potential motivators for young adults' (16- to 30-year olds) early COVID-19 mitigation behaviors as means of protecting older generations from the virus. We examined COVID-19 mitigation behavior inspired by Jin et al. (2021) and Romano et al. (2021) as (a) COVID-19 containing behaviors (first order cooperation) and (b) support of COVID-19 containment measures (second order cooperation). In line with the Norm Activation Model (NAM; Schwartz & Howard, 1981), we examined whether the awareness that older adults are especially vulnerable to the virus and at higher risk would act as a motivator for younger people to show COVID-19 containing behaviors. Since contact between groups is known to increase intergroup prosocial behaviors (see, e.g., Johnston & Glasford, 2018), we investigated the role of contact between younger and older generations as a motivator of young adults' COVID-19 containing behaviors and their support of COVID-19 containment measures. Intergroup contact is assumed to improve intergroup relations and behaviors by strengthening the extent to which members of different groups identify with each other. This so-called shared social identity has also shown to have a positive direct impact on prosocial behaviors (Gaertner & Dovidio, 2014). We therefore included social identification of young adults with older adults as a potential mediator and predictor.

2. Theory

2.1 Problem Awareness as a Motivator of Prosocial Behavior

According to the Norm Activation Model (NAM; De Groot & Steg, 2009; Schwartz, 1977; Schwartz & Howard, 1981), it is necessary that individuals are aware of the problem for prosocial behaviors to occur. The problem awareness, or awareness of need, reflects the awareness of the problem itself as well as the adverse consequences of not acting prosocially for other persons and things (Schwartz, 1977).

The NAM and its theoretical extensions have successfully predicted a broad range of prosocial intentions and behaviors, e.g., volunteer work (Schwartz & Fleishman, 1982) and blood donation, as well as pro-environmental behaviors, which can be considered a special case of prosocial behaviors (De Groot & Steg, 2009). The important role of problem awareness was validated in many studies, showing that people are more willing to help others perceived as vulnerable or in need of help (e.g., altruistic giving toward refugees; Fiedler et al., 2021; helping the poor; Piston, 2014). Kappes et al. (2018) presented participants with a hypothetical scenario about whether or not to stay at home when sick. Participants were more willing to stay at home

when elderly coworkers were at risk of infection and developing a severe course of disease than when younger coworkers were at risk of infection and develop only mild symptoms. In two recent studies from Germany, Hellmann et al. (2021) reported that participants exhibited more prosocial behaviors in social dilemma tasks when they perceived the recipients of the prosocial behavior to be vulnerable in relation to COVID-19. A recent study from Radic et al. (2021) showed that a higher awareness of the consequences of COVID-19 on individuals' health increased the support of travelers for pro-mandatory COVID-19 vaccinations.

We therefore expected young adults to report (a) more COVID-containing behaviors and (b) more support of COVID-19 containment measures the higher their awareness of older adults' vulnerability to COVID-19 (Hypotheses *H1a* and *H1b*) and the higher their awareness of COVID-19 as a serious problem for older adults (Hypotheses *H2a* and *H2b*). We additionally expected participants' awareness of older adults' vulnerability to COVID-19 to be related to their own perceived vulnerability and their awareness of COVID-19 as a serious problem for older adults.

2.2 Intergroup Contact as a Motivator for Prosocial Behavior Toward Outgroup Members

Research on prosocial behavior toward older people indicates that negative ageism, i.e., prejudice against people based on their perceived age (Nelson, 2016), is associated with a decreased willingness to help older adults, both in general (Sutter et al., 2017) and in the context of the COVID-19 pandemic (Lytle et al., 2020; Vale et al., 2020).

Intergroup contact has been identified as one promising way to reduce prejudices against members of other groups (e.g., older adults) and improve intergroup relations and behaviors. In his Intergroup Contact Theory, Allport (1954) stated that under certain circumstances, intergroup contact can reduce prejudice between groups and improve intergroup relations. In a meta-analytic test of the theory, Pettigrew and Tropp (2006a) found clear support for the hypothesis that intergroup contact reduces intergroup prejudice and that this effect tends to generalize beyond the participants in the immediate contact situation. Several studies provide evidence that intergroup contact can reduce prejudice and increase intergroup prosociality. Examples for studied behaviors are outgroup helping behavior (Johnston & Glasford, 2018) and political action intentions on behalf of an outgroup (Glasford, 2013).

Accordingly, Levy (2018) postulated that education about aging and positive intergenerational contact can reduce misinformation and ageist stereotypes, thereby increasing prosocial behavior toward older people. In their meta-analytic study, Pettigrew and Tropp (2006a) found contact with older adults and adults with mental illness combined to yield a mean

effect size of the contact-prejudice effect of r = -.18. In a survey study, Hale (1998)examined potential positive effects of intergenerational contact on stereotyping of older adults. Across different age groups, the quality of contact with older adults was positively associated with knowledge about aging and negatively associated with stereotyping older adults. Kwong and Yan (2021) reported that high-quality intergenerational contact led to improved attitudes of young adults toward older people and that these improved attitudes resulted in more prosocial behavior intentions.

Taken together, the presented theory and empirical evidence suggest a positive effect of intergroup contact on prosocial attitudes and behaviors, both in general as well as across different generations. This paper understands young adults' COVID-19 containing behavior and support of COVID-19 containment measures as prosocial behaviors toward older adults. We therefore hypothesize that contact with older adults may act as a motivator for COVID-19 containing behaviors (Hypothesis *H3a*) and support of COVID-19 containment measures (Hypothesis *H3b*) among young adults.

2.3 Shared Identity as a Motivator of Prosocial Behavior

A shared identity is assumed to be an important pathway through which intergroup contact can improve intergroup relations and prosocial behavior (see, e.g., Levine et al., 2005). According to the Social Categorization Theory (Turner, 1975), people categorize others on the basis of physical similarity, proximity, or shared fate into social categories(Gaertner & Dovidio, 2014). People within a shared social category meet each other with increased positive beliefs and feelings (i.e., ingroup favoritism). The perceived cost of not helping increases and the cost of helping decreases, motivating prosocial behavior (Gaertner & Dovidio, 2014). Since social categories are assumed to be fluid, the ingroup favoritism can be extended to former outgroup members through a recategorization process. Intergroup contact can trigger this recategorization process and strengthen shared identities (Levine et al., 2005).

There are several approaches to shared identity as a motivator of prosocial behavior. Some scholars focus on the role of a superordinate identity. Römpke et al. (2019) reported that individuals were more willing to restrain and cooperate, e.g., to conserve a scarce common resource, when a superordinate group identity was emphasized. Zagefka (2021) examined whether a focus on global or national solidarity differentially affects the intention to help those affected by the COVID-19 pandemic. A focus on national solidarity increased national (ingroup) helping intentions but decreased global (outgroup) helping intentions. However, a focus on an international, globally shared fate regarding the COVID-19 pandemic was

positively associated with the intention to help those in need across national borders. Accordingly, Van Bavel et al. (2020) suggested the shared experience of the COVID-19 pandemic disaster may foster a shared identity and increase concern for others and cooperative behavior in this disaster situation.

Other scholars see explicit identification with the outgroup affected by the crisis as the relevant shared identity for prosocial behavior. In their extended Social Identity Model of Collective Action, Van Zomeren et al. (2011) theorized that social identification with victims of social injustice is a central predictor of collective action to reduce the injustice on part of the members of unaffected groups. This assumption was supported by results from two studies: the more participants identified with discriminated ethnic minorities, the more willing they were to take action against racial discrimination (Van Zomeren et al., 2011).

To date, there has been little empirical research on how identification across generations is related to prosocial behavior between generations. However, Cadieux et al. (2019) provided evidence showing that young adults who reported a higher cognitive overlap between themselves and older adults, elicited by intergenerational contact, perceived older adults as more competent and expressed more positive attitudes toward them.

In our study, we integrate these approaches to shared identity, examining both general identification with older adults (identification with an outgroup more affected by the crisis) as well as identification with older adults based on the (partly) shared fate of the COVID-19 pandemic.

We hypothesize that the more participants identify with older adults in general (Hypotheses *H4.1a* and *H4.1b*) and based on the shared experience of the pandemic (Hypotheses *H4.2a* and *H4.2b*), the more (a) COVID-19 containing behaviors and (b) support of COVID-19 containment measures they would show.

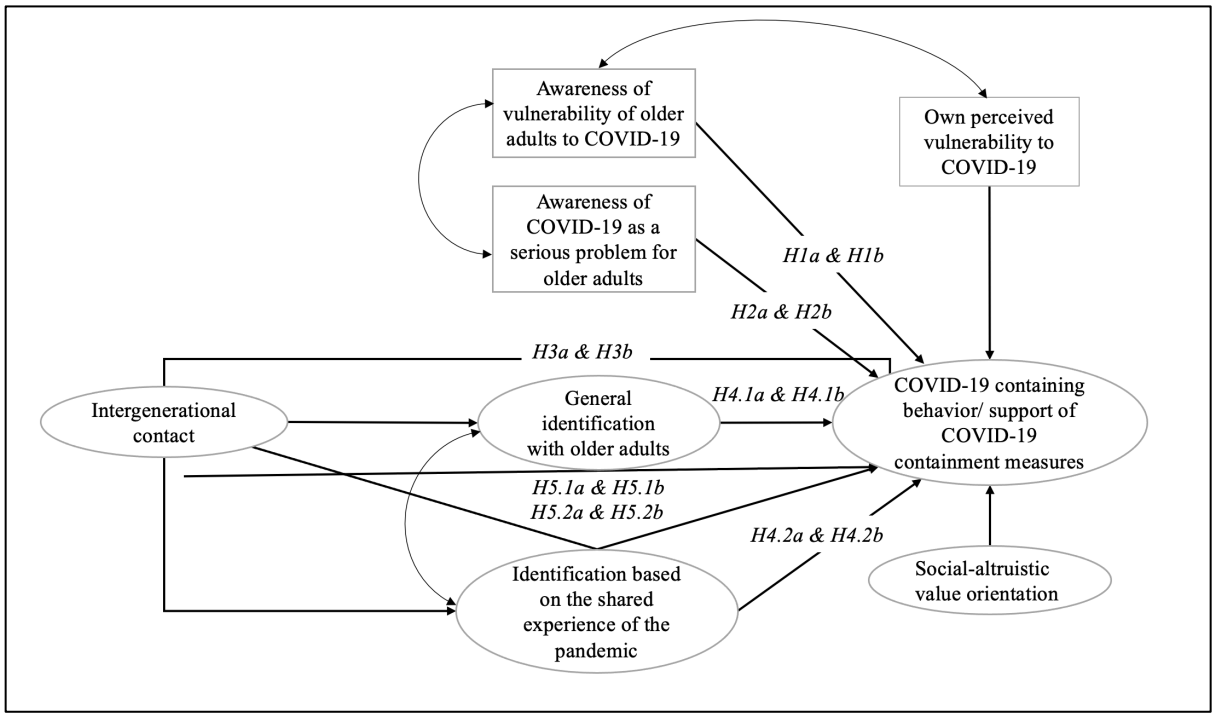
Consistent with Levine et al. (2005), we expected both general identification with older adults and identification with older adults based on the shared experience of the pandemic to be a result of, at least in part, intergenerational contact. We therefore tested the potential mediating effects of general identification (Hypotheses *H5.1a* and *H5.1b*) and identification with older adults based on the shared experience of the pandemic (Hypotheses *H5.2a* and *H5.2b*) on the influence of intergenerational contact on (a) COVID-19 containing behavior and (b) support of COVID-19 containment measures. Additionally, we expected a correlation between the two social identification variables. All postulated hypotheses can be found in Figure A.1.

2.4 Covariates

People who perceived themselves as more vulnerable to COVID-19 reported more COVID-19 prevention behaviors in a study by Yıldırım et al. (2021). In addition, researchers postulated a positive influence of prosocial motivations and social-altruistic values on COVID-19 prevention behaviors (Jordan et al., 2021). We therefore included one's own perceived vulnerability to COVID-19 and social-altruistic value orientation as covariates in the analyses.

Figure A.1

Postulated Structural Model and Hypotheses



Note. Ellipses represent latent variables; rectangles represent observed variables

3. Methods

3.1 Participants

The present study was designed and conducted following the APA guidelines on the ethical conduct of research. According to German Law, survey studies do not require ethical approval when anonymity is secured and no sensitive contents are assessed. In order to obtain a sample of young adults aged 16 to 30, participants were recruited through university and youth initiatives mailing lists and social media. Since the hypotheses were tested using Structural Equation Modeling, we aimed for a minimum sample size of N = 200, following Kline's suggestion (Kline, 2011).

259 participants completed the survey and $N = 258$ participants formed the final sample. Informed consent was obtained from all participants. The sample included 188 females, 66 males, and four of "diverse" gender. The age of the participants ranged from 16 to 30 years ($M = 24.21$, $SD = 3.27$). Young adults from all over Germany participated, with Lower Saxony and Saxony-Anhalt as the strongest represented federal states (see Appendix A.A for more sociodemographic information). Two €50 vouchers were raffled among all participants. Students from the local university additionally received a 0.5 "subject hour" for their participation.

At the time of data collection, the so-called third COVID-19 wave hit Germany with an incidence of 155 per 100,000 inhabitants (04/29/2021) and only 7.5% of citizens were fully vaccinated. 16- to 30-year-olds in Germany were not yet eligible for vaccination, except for exceptional cases (Robert Koch Institut, 2021b).

3.2 Measures

The questionnaire was piloted with 17 members of the target group, and only minor changes to the questionnaire were required.

Older adults were operationalized as over-60-year-olds, because the risk of a severe COVID-19 disease progression increases sharply over 60 (Robert Koch Institut, 2021a). For all measures, participants were always given the option of "Don't know/ no answer". The entire scales and scale characteristics can be found in Appendix A.B.

Participants' own perceived vulnerability to COVID-19 was measured with one item adapted from Pfattheicher et al. (2020): "How do you assess the danger for yourself if you would get infected with the coronavirus?". Participants could answer on a five-point Likert scale from 1 (Very harmless) to 5 (Very dangerous).

Social-altruistic value orientation was measured with three items ($\alpha = .75$) taken from the brief inventory of values (Stern et al., 1998) and measured on a scale from 1 (Opposed to my values) over 2 (Not important) to 9 (Extremely important).

Awareness of older adults' vulnerability to COVID-19 was measured with one item (adapted from Pfattheicher et al., 2020): "How do you assess the danger for over-60-year-olds if they would get infected with the coronavirus?". Participants could again answer on a five-point Likert scale from 1 (Very harmless) to 5 (Very dangerous).

Awareness of COVID-19 as a serious problem for older adults was measured with one item: "The affectedness of over-60-year-olds by the coronavirus is a serious problem."

measured on a five-point Likert agreement scale (1 = Don't agree at all to 5 = Completely agree).

The two awareness variables covered two differentiated aspects of the construct problem awareness, i.e., explicit vulnerability and general affectedness. For this reason, and to ensure comparability between participants' own perceived vulnerability to COVID-19 and their awareness of older adults' vulnerability to COVID-19, the two items were not merged. The bivariate correlation of only $r_s = .32$ supported this decision.

Intergenerational contact was measured with six items ($\alpha = .84$; e.g., "Usually, I have a lot of contact with over-60-year-olds.") on the five-point Likert agreement scale. Inspired by Voci and Hewstone's (2003) measure of intergroup contact, we developed a new measure of intergenerational contact, capturing both quantity and quality of the contact. An effort was made to develop a measure that assesses intergenerational contact in general and not restricted to contact during COVID-19 pandemic times.

General identification with older adults was measured with a scale adapted from Cameron (2004) and Van Zomeren et al. (2011) using six items ($\alpha = .83$; e.g., "I have many things in common with people that are over 60 years old") on the five-point Likert agreement scale.

Identification with older adults based on the shared experience of the pandemic was measured with three items ($\alpha = .73$; e.g., "I feel a connection to over-60-year-olds since we all experience the COVID-19 pandemic) on the five-point Likert agreement scale.

COVID-19 containing behavior was measured with twelve items ($\alpha = .82$) drawn from the COSMO Report (Betsch et al., 2020; e.g., "I wash my hands regularly and for 20 seconds.") on a five-point Likert scale (1 = Never to 5 = Always).

Support of COVID-19 containment measures was measured with one item: "What is your position regarding the current governmental measures aimed at the containment of the coronavirus?") on a five-point Likert scale (1 = Very opposed to 5 = Very much in favor).

3.3 Statistical Analyses

Descriptive statistics were calculated with IBM SPSS. Structural Equation Modeling (SEM) was used to assess both the underlying measurement models and to test the postulated structural models. SEMs were calculated in R using the package "lavaan" (Rosseel, 2012).

4. Results

4.1 Descriptive Statistics and Bivariate Correlations

Listwise deletion was used for descriptive and bivariate correlational analyses. Case wise maximum likelihood estimation was used for the SEM. Data was missing completely at random (Little's MCAR Test: $\chi 2$= 1417.77, df = 1365, p = .16). Means, standard deviations, and intercorrelations can be found in Table 1. Spearman's Rho was used to assess the intercorrelations because the variables inquired were not normally distributed.

Participants reported on average a high awareness of older adults' vulnerability to COVID-19 (94.6% of the participants indicated the vulnerability of older adults to COVID-19 as a 4 or 5 on a scale from 1 = Very harmless to 5 = Very dangerous), a high awareness of COVID-19 as a serious problem for older adults (85.2% assessed COVID-19 as a serious problem as a 4 or 5 on a 5-point Likert agreement scale), and frequent COVID-19 containing behaviors (68.2% of the participants had a composite score of 4 or higher on a 5-point Likert frequency scale). Participants perceived themselves as significantly less vulnerable to COVID-19 than older adults (t(255) = -28.46, M_{Diff} = -1.70, p < .001).

Table A.1

Descriptive Statistics and Correlations for Potential Motivators, COVID-19 Containing Behavior and Support of COVID-19 Containment Measures

	M	*SD*	1	2	3	4	5	6	7	8	9
(1) Social-altruistic value orientation	7.99	1.07		-.01	.15*	.24**	.11	.17*	.17*	.06	.02
(2) Own Vulnerability to COVID-19	2.73	1.01			.42***	.07	-.13	.04	.25***	.36***	.09
(3) Awareness of older adults' vulnerability to COVID-19	4.42	0.68				.30***	-.03	.04	.18*	.26***	.16*
(4) Awareness of COVID-19 as a serious problem for older adults	4.35	0.89					.12	.17*	.32***	.23**	.29***
(5) Intergenerational Contact	2.89	0.96						.42***	.40***	-.07	.09
(6) General identification with older adults	2.26	0.92							.48***	.03	.18*
(7) Identification with older adults based on the shared experience of the pandemic	3.12	1.03								.24**	.27***
(8) COVID-19 containing behavior	4.07	0.58									.27***
(9) Support of COVID-19 containment measures	3.33	0.99									

Note. $N = 191$. Spearman's Rho was used to assess the correlations. * $p < .05$. ** $p < .01$. *** $p < .001$.

4.2 Examining the Influence of Intergenerational Considerations on Young People's COVID-19 Containing Behavior

The model explained 37% of the variance in the criterion COVID-19 containing behavior (R^2 = .37; $\chi 2$ = 910.26, *df* = 485, $p < .001$, see Figure A.2 for Structural Model and Figure A.C1 in Appendix A.C for SEM including the Measurement Model). The model fit was satisfactory with *CFI* = .86, *RMSEA* = .06, *GFI* = .99 (Hu & Bentler, 1999). Of the covariates, only participants' own perceived vulnerability to COVID-19 significantly explained their COVID-19 containing behavior (β = .30, $p < .001$); whereas, the social-altruistic value orientation was not a significant predictor (β = .05, $p = .42$).

The awareness of older adults' vulnerability to COVID-19 significantly explained participants' COVID-19 containing behavior (β = .25, $p < .001$), supporting Hypothesis *H1a*. The awareness of COVID-19 as a serious problem for older adults significantly explained the criterion with β = .24 ($p < .001$), supporting Hypothesis *H2a*.

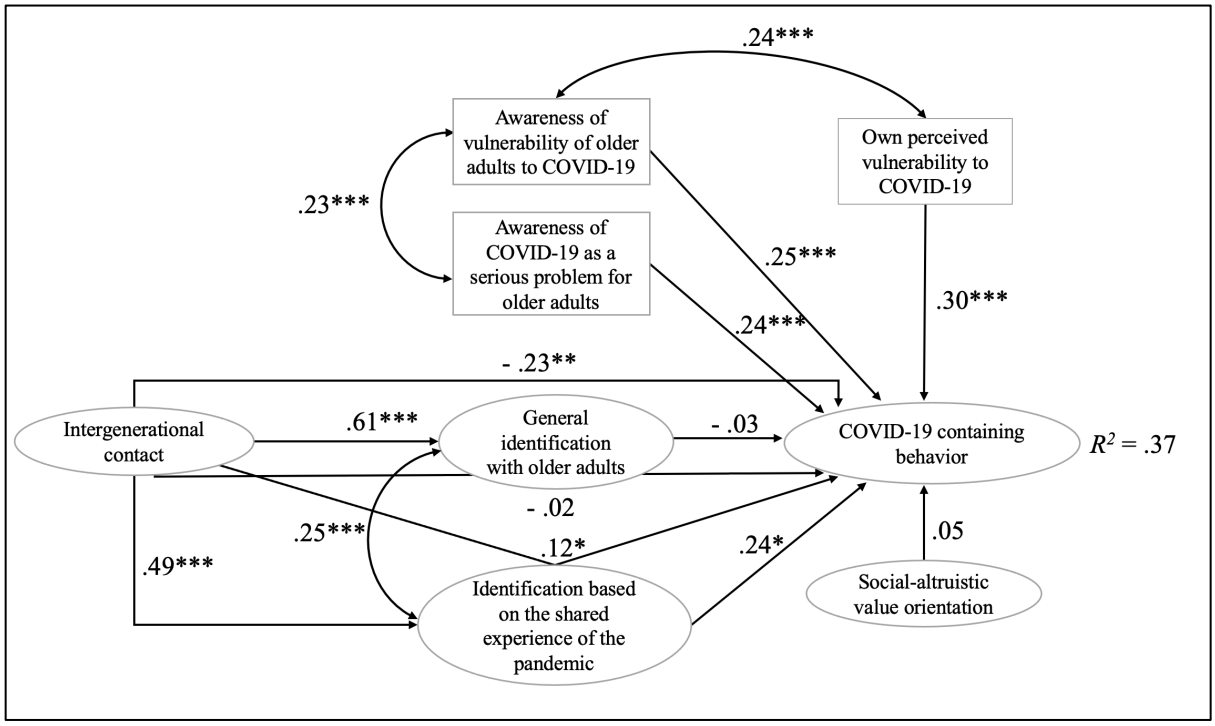
Intergenerational contact did significantly explain participants' COVID-19 containing behavior (β = -.23, $p = .01$), but in the direction opposite to the postulated hypothesis (rejection of Hypothesis *H3a*). However, it positively explained general identification with older adults (β = .61, $p < .001$) and the identification with older adults based on the shared experience of the pandemic (β = .49, $p < .001$). General identification with older adults did not explain participants' COVID-19 containing behavior (β = -.03, $p = .78$). We therefore rejected Hypothesis *H4.1a*. Hypothesis *H4.2a*, however, was supported by the data: identification with older adults based on the shared experience of the pandemic significantly explained participants' COVID-19 containing behavior (β = .24, $p = .02$).

We tested the postulated mediations (*H5.1a* and *H5.2a*) by calculating the two indirect effects of intergenerational contact through general identification with older adults and the identification with older adults based on the shared experience of the pandemic on COVID-19 containing behavior. While the indirect effect of intergenerational contact through general identification with older adults turned out non-significant (β = -.02, $p = .76$), the indirect effect of intergenerational contact through identification with older adults based on the shared experience of the pandemic was significant (β = .12, $p = .03$). However, it should be kept in mind that the direct effect of intergenerational contact on the criterion was significantly negative. Hence, the first condition of a mediation (Baron & Kenny, 1986), a direct effect of

the predictor on the criterion, was not present in the expected direction. We therefore rejected the postulated mediation hypotheses *H5.1a* and *H5.2a*.

Figure A.2

Structural Model Predicting COVID-19 Containing Behavior



Note. N = 217. Ellipses represent latent variables; rectangles represent observed variables. Displayed are standardized regression coefficients, bivariate correlations and R^2. * $p < .05$. ** $p < .01$. *** $p < .001$.

4.3 Examining the Influence of Intergenerational Considerations on Young Adults' Support of COVID-19 Containment Measures

The model explained 13% of the variance in participants' support of COVID-19 containment measures ($R^2 = .13$; $\chi 2 = 396.66$, $df = 200$, $p < .001$, see Figure A.A3 for Structural Model and Figure A.C2 in Appendix A.C for SEM including the Measurement Model). The model fit was satisfactory with *CFI* = .91, *RMSEA* = .06, *GFI* = .99. Neither participants' own perceived vulnerability to COVID-19 (β = -.05, p = .43) nor their social-altruistic value orientation (β = -.03, p = .68) significantly explained the criterion.

Participants' awareness of older adults' vulnerability to COVID-19 significantly explained their support of COVID-19 containment measures (β = .15, p = .03, supporting Hypothesis *H1b*). The awareness of COVID-19 as a serious problem for older adults explained the criterion with β = .17 (p = .01), confirming Hypothesis *H2b*.

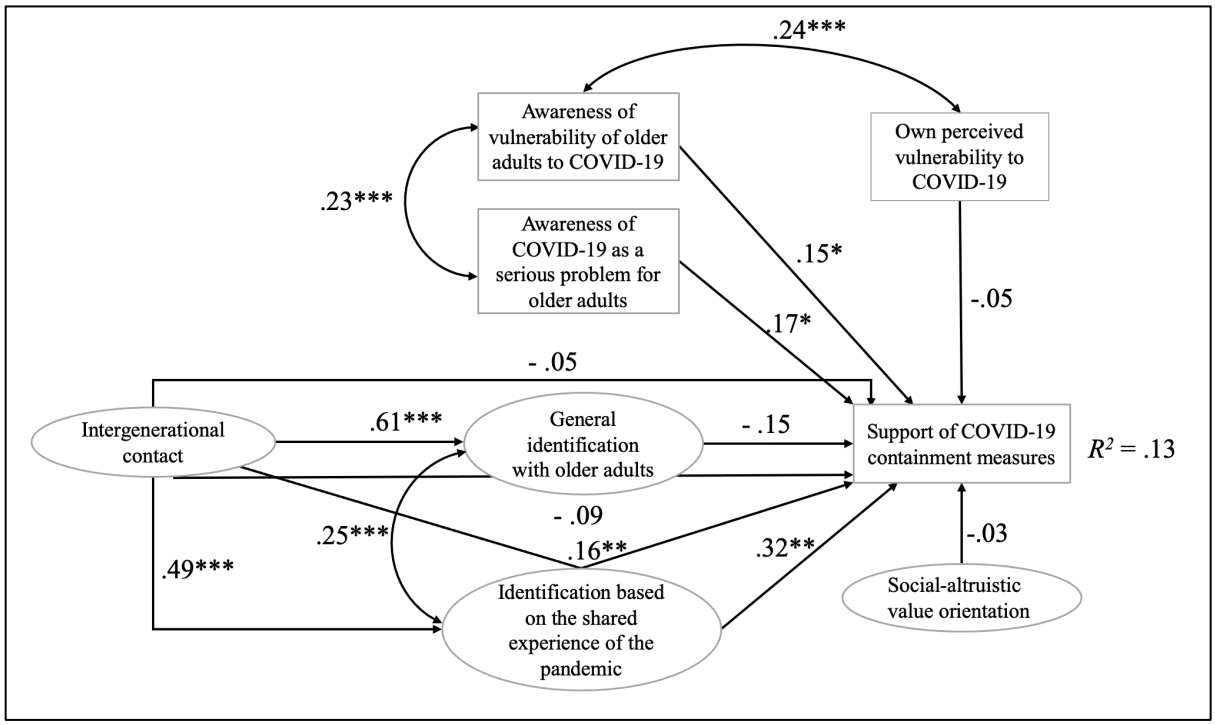
Intergenerational contact did not significantly explain the criterion (β = -.05, p = .61), Hypothesis *H3b* was thus rejected. Again, intergenerational contact positively explained general identification (β = .60, p < .001) and the identification with older adults based on the shared experience of the pandemic (β = .49, p < .001).

The general identification with older adults did not explain participants' support of COVID-19 containment measures, we therefore rejected Hypothesis *H4.1b* (β = -.15, p = .15). However, identification with older adults based on the shared experience of the pandemic was a significant predictor of participants' support for COVID-19 containment measures (β = .32, p < .01), confirming Hypothesis *H4.2b*. It emerged as the strongest predictor.

The indirect effect of intergenerational contact on the criterion through general identification was not significant (β = -.09, p = .15). The second indirect effect again turned out significant (β = .16, p < .01). However, since the direct effect of intergenerational contact on the criterion was non-significant, we rejected both mediation hypotheses *H5.1b* and *H5.2b* based on Baron an Kenny's (1986) criterions for a mediation.

Figure A.3

Structural Model Predicting Support of COVID-19 Containment Measures



Note. N = 225. Ellipses represent latent variables; rectangles represent observed variables. Displayed are standardized regression coefficients, bivariate correlations and R^2. * p < .05. ** p < .01. *** p < .001.

5. Discussion

Since the beginning of the pandemic, the intergenerational dynamics of the COVID-19 pandemic have been widely discussed, but research is scarce (Vale et al., 2020). The purpose of the present study was to investigate whether, at the onset of the pandemic, considerations of the physically vulnerable older generations may have motivated younger adults to show increased COVID-19 containing behaviors and to support containment measures. Results indicate that being aware of older adults' affectedness and vulnerability in the pandemic and identifying with them based on the shared experience of the pandemic motivated young Germans to engage in COVID-19 related prosocial behaviors toward older adults.

5.1 The Influence of Intergenerational Considerations on COVID-19 Containing Behavior and Support of COVID-19 Containment Measures

While participants' own perceived vulnerability did not explain the support of COVID-19 measures, it positively explained COVID-19 containing behaviors. Although young adults' health was, at the time, less affected by the virus, COVID-19 containing behaviors still had almost immediate personal benefits (reduction in risk of infection, especially relevant when one is vulnerable); whereas, the benefits of supporting COVID-19 containment measures were less immediate and may have been perceived at a societal level rather than at an individual level.

Participants' social-altruistic value orientation did not explain their COVID-19 containing behavior or their support of COVID-19 containment measures. Although this result is contrary to our expectations, it is consistent with a recent study by Rosman et al. (2021), in which younger people's prosocial value orientation was not associated with their vaccination intention.

Awareness of older adults' vulnerability to COVID-19 and awareness of COVID-19 as a serious problem for older adults emerged as significant and strong predictors of both participants' COVID-19 containing behavior and their support of COVID-19 containment measures. These findings are consistent with the predictions of the Norm Activation Model (Schwartz & Howard, 1981) and are supported by other studies on prosocial behavior of young adults in the midst of the pandemic (e.g., Hellmann et al., 2021).

Although not a significant predictor of support of COVID-19 containment measures, intergenerational contact significantly predicted participants' COVID-19 containing behavior. However, contrary to previous research on the positive influence of intergroup contact on intergroup prosocial behavior and the postulated hypothesis, participants showed *fewer* COVID-19 containing behaviors the more frequent and quality contact they had with older adults. This result is at a first glance startling. However, one of the most effective ways to

protect older adults from a COVID-19 infection was to reduce physical contacts. Although intergenerational contact quantity and quality should be reported generally and not specifically for the COVID-19 period, it is possible that participants reported a reduced contact due to COVID-19. This could explain the negative relationship with COVID-19 containing behaviors. However, this negative relationship of intergenerational contact and COVID-containing behavior needs to be interpreted with caution, as there was no significant bivariate correlation between the two variables (see Table A.1).

Identification with older adults on a general level did not predict COVID-19 containing behavior or the support of COVID-19 containment measures among young people. One possible explanation is that it might be questionable whether a general identification without a focused shared characteristic (such as citizens of Germany) would guide behavior.

Identification with older adults based on the shared experience of the COVID-19 pandemic was a relevant predictor of both participants' COVID-19 containing behavior and their support of COVID-19 containment measures. The perception of individuals experiencing a crisis collectively (shared fate) could motivate behaviors that directly benefit others from the collective, as well the support of measures that benefit the entire collective more broadly. This finding goes in line with results from other studies that highlight the role of shared identities on prosociality in the pandemic (Zagefka, 2021).

Taken together, the results suggest that intergenerational considerations of vulnerable generations might have the potential to increase the prosociality of lesser affected generations and might bridge the different costs and benefits associated with the asymmetry of the pandemic.

5.2 Limitations

The present study has several limitations that must be considered when interpreting the results. Even though the sample size obtained exceeded the recommended sample size for SEM (Kline, 2011), a larger sample size would have resulted in a greater power.

We attempted to measure intergenerational contact independent of the current COVID-19 situation. It is however possible that the measure was still influenced by contact reductions that were in place at the time and thus did not measure intergenerational contact independently.

The pandemic features are constantly changing including incidences, behavioral recommendations, and vaccination availability. Intergenerational dynamics may also change as the pandemic progresses. This process could not be investigated in this cross-sectional study.

In the present study, only one pathway of the bidirectional intergenerational relationship was investigated. It would have been informative to measure the intergenerational considerations and prosocial behaviors of older adults toward young adults because young adults also suffer from the pandemic and need support. Unfortunately, studying this direction exceeded the scope of this study.

Finally, as is always the case with correlational study designs, it should be kept in mind that the correlational design of the present study does not allow for causal inferences.

5.3 Implications for Future Research and Practice

The present paper provides initial insights into intergenerational considerations as motivators for a lesser affected generation to side with and aid a more affected generation in the large-scale crisis of the COVID-19 pandemic. Although identification with other generations has already been discussed in several papers (Fritsche et al., 2018), the present study was, to our knowledge, one of the first (along with, e.g., Cadieux et al., 2019) to explicitly measure identification with members of another generation, both in general as well as based on a shared fate. The measures of intergenerational identification and intergenerational contact could be revised in future studies.

The present study represents a good starting point for examining prosocial behavior between different generations in other large-scale crises. Given the threats posed by the climate crisis and other environmental problems, intergenerational considerations and prosociality are becoming increasingly important. In the climate crisis, with its inverse intergenerational dynamics, individuals living today must forgo their own benefits and limit the consequences of the climate crisis for the benefit of young and future generations. The results of the present paper could be used to investigate potential intergenerational motivators for today's generations' climate protection behaviors.

This study identifies potential motivators for prosocial behavior of a lesser affected generation toward a more affected generation. However, large-scale crisis such as the COVID-19 pandemic and the climate crisis require all generations to pull together to overcome them. Future studies should therefore examine prosociality in the interaction of different generations, not just from one generation to another.

As for practical implications, the results of this study suggest that young adults could be motivated to comply with and support COVID-19 regulations by raising and appealing to their awareness of the affectedness of vulnerable groups and focusing on the shared identity of people experiencing the pandemic together. Although the majority of vulnerable people in

Germany are vaccinated (as of October 2022, 90.0% of the over-60-year-olds in Germany were fully vaccinated; Robert Koch Institut, 2022), the vaccine does not guarantee a 100% protection against an infection (Robert Koch Institut, 2021c). This illustrates that particularly vulnerable groups still rely on groups whose health is less affected to act prosocially.

5.4 Conclusion

The present paper is one of the first to empirically examine the often-discussed intergenerational characteristics of the COVID-19 pandemic. We applied prominent social psychology concepts that in the past have successfully explained a variety of prosocial behaviors to COVID-19 related intergenerational prosocial behaviors among young adults. Neither contact with older adults nor a general identification with older adults proved to be a motivator for young adults' COVID-19 containing behaviors or measure support in the pandemic. However, identification with older adults based on the shared experience of the pandemic positively predicted prosocial behaviors to protect this generation in the context of the COVID-19 pandemic. Even more relevant seems to be the awareness of the vulnerability of the older generation and the awareness of the seriousness of the pandemic for them. We conclude that intergenerational considerations might play a role in motivating prosociality between generations in large-scale crises.

6. References

Allport, G. W. (1954). *The Nature of Prejudice*. Addison Wesley.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology 51*(6), 1173-1182.

Betsch, C., Wieler, L., Bosnjak, M., Ramharter, M., Stollorz, V., Omer, S., Korn, L., Sprengholz, P., Felgendreff, L., & Eitze, S. (2020). *Germany COVID-19 Snapshot Monitoring (COSMO Germany): Monitoring knowledge, risk perceptions, preventive behaviours, and public trust in the current coronavirus outbreak in Germany*. PsychArchives.

Cadieux, J., Chasteen, A. L., & Packer, P., Dominic J. (2019). Intergenerational contact predicts attitudes toward older adults through inclusion of the outgroup in the self. *The Journals of Gerontology: Series B*, *74*(4), 575-584. https://doi.org/https://doi.org/10.1093/geronb/gbx176

Cameron, J. E. (2004). A three-factor model of social identity. *Self and Identity 3*(3), 239-262. https://doi.org/10.1080/13576500444000047

De Groot, J. I., & Steg, L. (2009). Morality and prosocial behavior: The role of awareness, responsibility, and norms in the norm activation model. *The Journal of Social Psychology 149*(4), 425-449. https://doi.org/10.3200/SOCP.149.4.425-449

Eurofound. (2020). Living, working and COVID-19. In *COVID-19 series*. Publications Office of the European Union, Luxembourg: Eurofound.

Fiedler, S., Glöckner, A., & Hellmann, M. (2021). Altruistic giving towards refugees: Identifying factors that increase citizens' willingness to help. *Frontiers in Psychology*, 1-20. https://doi.org/10.3389/fpsyg.2021.689184

Fritsche, I., Barth, M., Jugert, P., Masson, T., & Reese, G. (2018). A social identity model of pro-environmental action (SIMPEA). *Psychological Review*, *125*(2), 245–269. https://doi.org/10.1037/rev0000090

Furuse, Y., Sando, E., Tsuchiya, N., Miyahara, R., Yasuda, I., Ko, Y. K., Saito, M., Morimoto, K., Imamura, T., & Shobugawa, Y. (2020). Clusters of coronavirus disease in communities, Japan, January–April 2020. *Emerging Infectious Diseases 26*(9), 2176–2179. https://doi.org/10.3201/eid2609.202272

Gaertner, S. L., & Dovidio, J. F. (2014). *Reducing Intergroup Bias: The Common Ingroup Identity Model*. Routledge.

Glasford, D. E. (2013). Seeing is believing: communication modality, anger, and support for action on behalf of out-groups. *Journal of Applied Social Psychology*, *43*(11), 2223-2230. https://doi.org/10.1111/jasp.12173

Hale, N. M. (1998). Effects of age and interpersonal contact on stereotyping of the elderly. *Current Psychology*, *17*(1), 28-38. https://doi.org/https://doi.org/10.1007/s12144-998-1019-2

Hellmann, D. M., Dorrough, A., & Glöckner, A. (2021). Prosocial behavior during the COVID-19 pandemic in Germany. The role of responsibility and vulnerability. *Heliyon*, e08041. https://doi.org/10.1016/j.heliyon.2021.e08041

Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal 6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Jin, S., Balliet, D., Romano, A., Spadaro, G., Van Lissa, C. J., Agostini, M., Bélanger, J. J., Gützkow, B., Kreienkamp, J., & Leander, N. P. (2021). Intergenerational conflicts of

interest and prosocial behavior during the COVID-19 pandemic. *Personality and Individual Differences*, *171*, 1-8. https://doi.org/10.1016/j.paid.2020.110535

Johnston, B. M., & Glasford, D. E. (2018). Intergroup contact and helping: How quality contact and empathy shape outgroup helping. *Group Processes & Intergroup Relations*, *21*(8), 1185-1201. https://doi.org/10.1177/136843021771177

Jordan, J. J., Yoeli, E., & Rand, D. G. (2021). Don't get it or don't spread it: Comparing self-interested versus prosocial motivations for COVID-19 prevention behaviors. *Scientific Reports 11*(1), 1-17. https://doi.org/10.1038/s41598-021-97617-5

Kappes, A., Nussberger, A.-M., Faber, N. S., Kahane, G., Savulescu, J., & Crockett, M. J. (2018). Uncertainty about the impact of social decisions increases prosocial behaviour. *Nature Human Behaviour 2*(8), 573-580. https://doi.org/10.1038/s41562-018-0372-x

Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling* (3rd ed.). Guilford Press.

Kwong, A. N., & Yan, E. C. (2021). The Role of Quality of Face-to-face Intergenerational Contact in Reducing Ageism: The Perspectives of Young People. *Journal of Intergenerational Relationships*, *21*(1), 136–151. https://doi.org/10.1080/15350770.2021.1952134

Levine, M., Prosser, A., Evans, D., & Reicher, S. (2005). Identity and emergency intervention: How social group membership and inclusiveness of group boundaries shape helping behavior. *Personality and Social Psychology Bulletin*, *31*(4), 443-453. https://doi.org/10.1177/0146167204271651

Levy, S. R. (2018). Toward reducing ageism: PEACE (positive education about aging and contact experiences) model. *The Gerontologist*, *58*(2), 226-232. https://doi.org/10.1093/geront/gnw116

Lytle, A., Apriceno, M., Macdonald, J., Monahan, C., & Levy, S. R. (2020). Pre-pandemic Ageism Toward Older Adults Predicts Behavioral Intentions During the COVID-19 Pandemic. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, e11-e15. https://doi.org/10.1093/geronb/gbaa210

Nelson, T. D. (2016). The age of ageism. *Journal of Social Issues 72*(1), 191-198. https://doi.org/10.1111/josi.12162

Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. *Journal of Personality and Social Psychology 90*(5), 751–783. https://doi.org/10.1037/0022-3514.90.5.751

Pfattheicher, S., Nockur, L., Böhm, R., Sassenrath, C., & Petersen, M. B. (2020). The emotional path to action: Empathy promotes physical distancing and wearing of face masks during the COVID-19 pandemic. *Psychological Science*, *31*(11), 1363-1373. https://doi.org/10.1177/095679762096442

Piston, S. C. (2014). *Sympathy for the Poor, Resentment of the Rich, and their Political Consequences* [Doctoral dissertation, University of Michigan]. Ann Arbor, Michigan.

Radic, A., Koo, B., Gil-Cordero, E., Cabrera-Sánchez, J. P., & Han, H. (2021). Intention to Take COVID-19 Vaccine as a Precondition for International Travel: Application of Extended Norm-Activation Model. *International Journal of Environmental Research and Public Health*, *18*(6), 3104. https://doi.org/10.3390/ijerph18063104

Renner, R. (2021). *Millennials and Gen Z are spreading coronavirus—but not because of parties and bars*. National Geographic. Retrieved 11-04-2020 from https://www.nationalgeographic.com/science/article/millennials-generation-z-coronavirus-scapegoating-beach-parties-bars-inequality-cvd

Robert Koch Institut. (2021a). *Epidemiologischer Steckbrief zu SARS-CoV-2 und COVID-19*. Robert Koch Institut. Retrieved 11-04-2021 from https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Steckbrief.html;jses

sionid=B28C5192FA617141C410AD4115494550.internet092?nn=13490888#doc13776792bodyText15
Robert Koch Institut. (2021b). *Täglicher Lagebericht des RKI zur Coronavirus-Krankheit-2019 (COVID-19)* Retrieved 02-09-2022 from https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Situationsberichte/Gesamt.html
Robert Koch Institut. (2021c). *Wirksamkeit*. Retrieved 11-08-2021 from https://www.rki.de/SharedDocs/FAQ/COVID-Impfen/FAQ_Liste_Wirksamkeit.html
Robert Koch Institut. (2022). *Impfquotenmonitoring* https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Daten/Impfquotenmonitoring.html
Romano, A., Spadaro, G., Balliet, D., Joireman, J., Van Lissa, C., Jin, S., Agostini, M., Bélanger, J. J., Gützkow, B., & Kreienkamp, J. (2021). Cooperation and trust across societies during the COVID-19 pandemic. *Journal of Cross-Cultural Psychology*, *52*(7), 623-642. https://doi.org/10.1177/00220221209889913
Römpke, A. K., Fritsche, I., & Reese, G. (2019). Get together, feel together, act together: International personal contact increases identification with humanity and global collective action. *Journal of Theoretical Social Psychology*, *3*(1), 35-48. https://doi.org/10.1002/jts5.34
Rosman, T., Adler, K., Barbian, L., Blume, V., Burczeck, B., Cordes, V., Derman, D., Dertli, S., Glas, H., & Heinen, V. (2021). Protect ya Grandma! The Effects of Students' Epistemic Beliefs and Prosocial Values on COVID-19 Vaccination Intentions. *Frontiers in Psychology*, *12*, 1-11. https://doi.org/10.3389/fpsyg.2021.683987
Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling and more. Version 0.5–12 (BETA). *Journal of Statistical Software 48*(2), 1-36
Rudert, S. C., & Janke, S. (2021). Following the crowd in times of crisis: Descriptive norms predict physical distancing, stockpiling, and prosocial behavior during the COVID-19 pandemic. *Group Processes & Intergroup Relations*, 1-17. https://doi.org/10.1177/13684302211023562
Schwartz, S. H. (1977). Normative influences on altruism. *Advances in Experimental Social Psychology 10*, 221-279. https://doi.org/10.1016/S0065-2601(08)60358-5
Schwartz, S. H., & Fleishman, J. A. (1982). Effects of negative personal norms on helping behavior. *Personality and Social Psychology Bulletin*, *8*(1), 81-86. https://doi.org/10.1177/014616728281013
Schwartz, S. H., & Howard, J. A. (1981). A normative decision-making model of altruism. In J. P. Rushton & R. M. Sorrentino (Eds.), *Altruism and Helping Behavior* (pp. 89-211). Erlbaum.
Stern, P. C., Dietz, T., & Guagnano, G. A. (1998). A brief inventory of values. *Educational and Psychological Measurement 58*(6), 984-1001. https://doi.org/10.1177/0013164498058006008
Sutter, M., Perrin, P. B., Tabaac, A. R., Parsa, L., & Mickens, M. (2017). Do ableism and ageism predict college students' willingness to provide care for a family member with a chronic health condition? *Stigma and Health*, *2*(2), 110-120. https://doi.org/10.1037/sah0000045
Turner, J. C. (1975). Social Comparison and Social Identity: Some Prospects for Intergroup Behaviour. *European Journal of Social Psychology*, *5*(1), 1-34. https://doi.org/10.1002/ejsp.2420050102
Vale, M. T., Stanley, J. T., Houston, M. L., Villalba, A. A., & Turner, J. R. (2020). Ageism and behavior change during a health pandemic: a preregistered study. *Frontiers in Psychology*, *11*, 1-12. https://doi.org/10.3389/fpsyg.2020.587911

Van Bavel, J. J., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., Crockett, M. J., Crum, A. J., Douglas, K. M., & Druckman, J. N. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour 4*(5), 460-471. https://doi.org/10.1038/s41562-020-0884-z

Van Lange, P. A., Joireman, J., Parks, C. D., & Van Dijk, E. (2013). The psychology of social dilemmas: A review. *Organizational Behavior and Human Decision Processes*, *120*(2), 125-141. https://doi.org/10.1016/j.obhdp.2012.11.003

Van Zomeren, M., Postmes, T., Spears, R., & Bettache, K. (2011). Can moral convictions motivate the advantaged to challenge social inequality? Extending the social identity model of collective action. *Group Processes & Intergroup Relations*, *14*(5), 735-753. https://doi.org/10.1177/1368430210395637

Voci, A., & Hewstone, M. (2003). Intergroup contact and prejudice toward immigrants in Italy: The mediational role of anxiety and the moderational role of group salience. *Group Processes & Intergroup Relations*, *6*(1), 37-54. https://doi.org/10.1177/1368430203006001011

Yıldırım, M., Geçer, E., & Akgül, Ö. (2021). The impacts of vulnerability, perceived risk, and fear on preventive behaviours against COVID-19. *Psychology, Health & Medicine 26*(1), 35-43. https://doi.org/10.1080/13548506.2020.1776891

Zagefka, H. (2021). Prosociality during COVID-19: Globally focussed solidarity brings greater benefits than nationally focussed solidarity. *Journal of Community & Applied Social Psychology*, *32*(1), 73-86. https://doi.org/10.1002/casp.2553

Acknowledgements

We thank Lea Sassen for providing writing assistance.

Funding

This work was supported by the Deutsche Bundesstiftung Umwelt (DBU; grant number: 20020/692).

Declaration of Interests

The authors report there are no competing interests to declare.

Appendix

Appendix A.A

Table A.A1

Participants' Employment Status

Current employment status	*N*	%
Student	5	1.9
Intern	4	1.6
Apprentice	4	1.6
College/ university student	187	72.5
Minor Employment	1	0.4
Part time employee	16	6.2
Full time employee	26	10.1
Housewife/ Househusband	0	0
Self-employed	3	1.2
On sick leave/ unable to work	0	0
Unemployed/ looking for a job	1	0.4
Other	12	4.3

Table A.A2

Place of Residence (Federal States)

Federal State	*N*	%
Baden-Württemberg	26	10.1
Bavaria	14	5.4
Berlin	19	7.4
Brandenburg	2	0.8
Bremen	7	2.7
Hamburg	7	2.7
Hesse	12	4.7

Mecklenburg-West Pomerania	2	0.8
Lower Saxony	70	27.1
Northrhine-Westphalia	18	7.0
Rhineland Palatinate	3	1.2
Saarland	0	0
Saxony	14	5.4
Saxony Anhalt	60	23.2
Schleswig-Holstein	1	0.4
Thuringia	1	0.4
No answer	2	0.8

Appendix A.B

A.B.1 Scales and Normal Distribution Checks

Participants were always given the option "Don't know/ no answer". Participants' own perceived vulnerability to COVID-19 was measured with one item: "How do you assess the danger for yourself if you would get infected with the coronavirus?". Participants could answer on a scale from 1 (Very harmless) to 5 (Very dangerous). The item was not normally distributed with $W(191) = .90$, $p < .001$.

Social-altruistic value orientation was measured with three items: "Social justice, correcting injustice, care for the weak", "Equality, equal opportunity for all", "A world at peace, free of war and conflict". Participants could answer on a scale from 1 (Opposed to my values) over 2 (Not important) to 9 (Extremely important). The scale was not normally distributed with $W(191) = 82$, $p < .001$.

The awareness of older adults' vulnerability to COVID-19 was measured with one item: "How do you assess the danger for over-60-year-olds if they would get infected with the coronavirus?". Participants could answer on a scale from 1 (Very harmless) to 5 (Very dangerous). The item was not normally distributed with $W(191) = 70$, $p < .001$.

Awareness of COVID-19 as a serious problem for older adults was measured with one item: "The affectedness of over-60-year-olds by the coronavirus is a serious problem." measured on a five-point Likert scale (1 = Don't agree at all to 5 = Completely agree). The item was not normally distributed with $W(191) = 70$, $p < .001$.

Intergenerational contact was measured with six items ("Usually, I have a lot of contact with over-60-year olds.", "I know many over-60-year olds.", "There are many over-60-year olds in my close social surroundings.", "I have a good relationship with over-60-year

olds.", "I get along with the over-60-year olds in my social surroundings.", "Important people in my life are over 60 years old."). Participants could answer on a five-point Likert scale (1 = Don't agree at all to 5 = Completely agree). The scale was not normally distributed with $W(191) = .98$, $p = .01$.

General identification with older adults was measured using six items ("I have many things in common with people that are over 60 years old.", "I sense a strong relationship to over-60-year olds.", "In a group of over-60-year olds I feel like I belong.", "I identify with over-60-year olds.", "There are groups of over-60-year olds which I feel like I belong to." "There are over-60-year olds that I identify with."). Participants could answer on a five-point Likert scale (1 = Don't agree at all to 5 = Completely agree). The scale was not normally distributed with $W(191) = .96$, $p < .001$.

Identification with older adults based on the shared experience of the pandemic was measured with three items ("I feel a connection to over-60-years olds since we all experience the COVID-19 pandemic.", "I identify with over-60-year olds, since they, like me, experience the COVID-19 pandemic.", "Over-60-year olds and I share a common fate in the COVID-19 pandemic."). Participants could answer on a five-point Likert scale (1 = Don't agree at all to 5 = Completely agree). The scale was not normally distributed with $W(191) = .97$, $p < .001$.

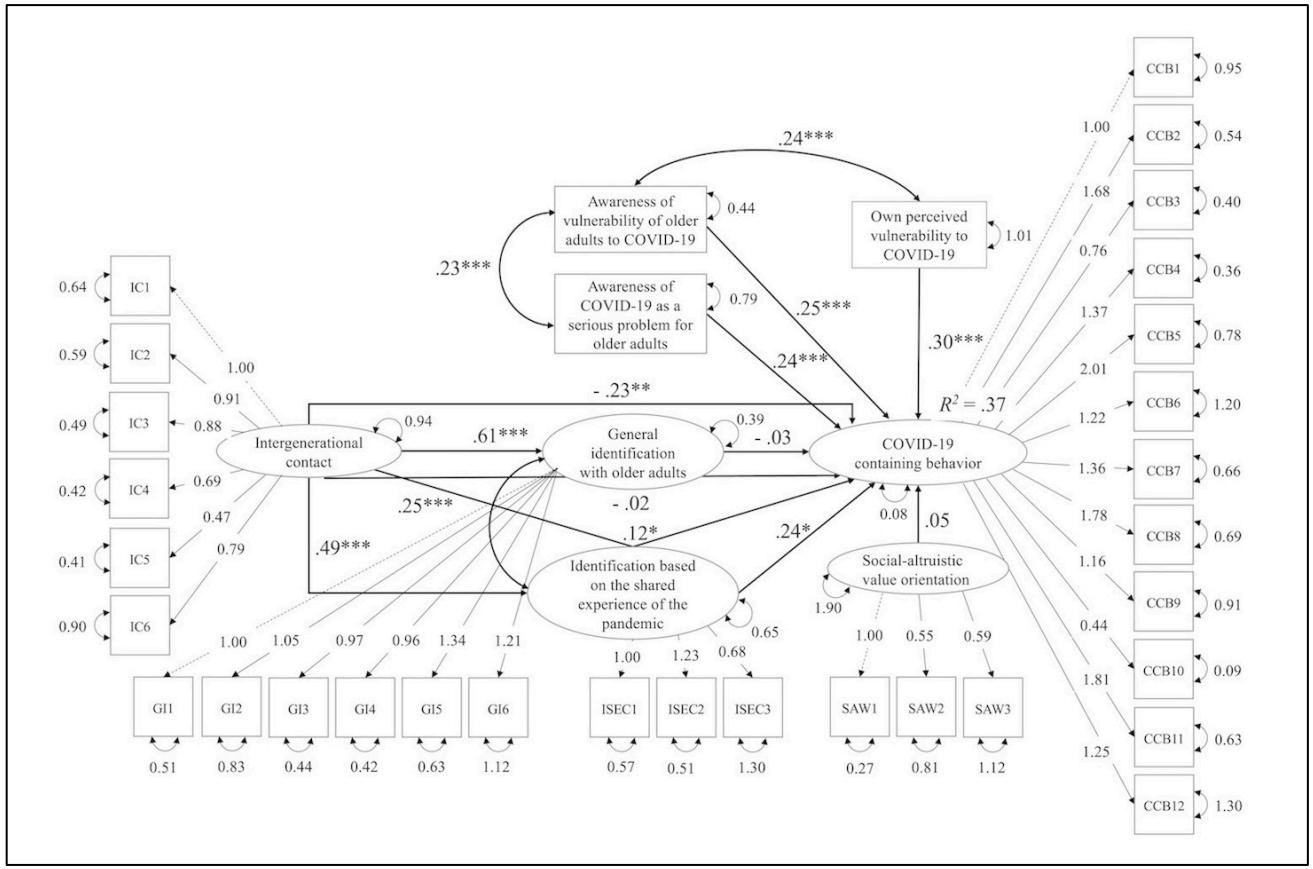
COVID-19 containing behavior was measured with twelve items ("I wash my hands regularly and for 20 seconds.", "I maintain a security distance to people that are not part of my household.", "I avoid touching eyes, nose and mouth with unwashed hands.", "I stay at home when feeling sick.", "I avoid shaking hands.", "I avoid closed rooms with bad ventilation.", "I refrain from travelling for personal purposes.", "I avoid public places.", "Before wearing a medical full-face-mask became mandatory, I wore at least a fabric mask when going to shops/ public places.", "I always wear a medical full-face-mask in shops, public transport, etc.", "In private places I only meet people from my household and maximum one other household.", "I do not participate in private parties"). Participants could answer on a five-point Likert scale (1 = Never to 5 = Always). The scale was not normally distributed with $W(191) = .90$, $p < .001$.

The support of COVID-19 containment measures was measured with one item: "What is your position regarding the current governmental measures aimed at the containment of the coronavirus?"). Participants could answer on a five-point Likert scale (1 = Very opposed to 5 = Very in favor). The scale was not normally distributed with $W(191) = .89$, $p < .001$.

Appendix A.C

Figure A.C1

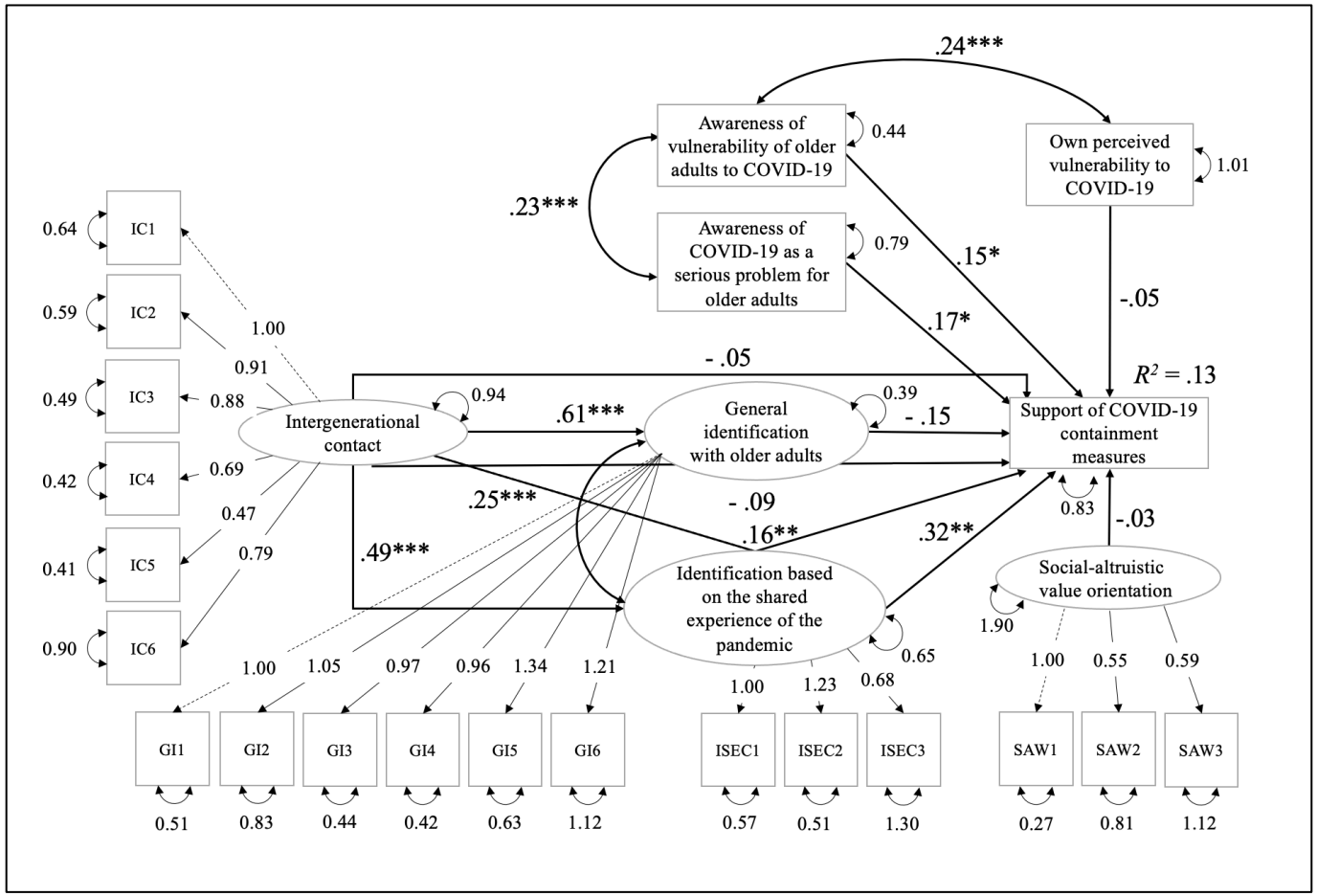
Measurement Model and Structural Model Predicting COVID-19 Containing Behavior



Note. $N = 217$. Squares represent indicators, ellipses represent latent variables. Displayed are factor loadings, variances, error covariances, standardized regression coefficients and bivariate correlations. * $p < .05$. ** $p < .01$. *** $p < .001$.

Figure A.C2

Measurement Model and Structural Model Predicting Support of COVID-19 Containment Measures



Note. $N = 225$. Squares represent indicators, ellipses represent latent variables. Displayed are factor loadings, variances, error covariances, standardized regression coefficients and bivariate correlations. * $p < .05$. ** $p < .01$. *** $p < .001$.

Additional Information on Publication A

Journal Scope

The Journal of Intergenerational Relationships is the forum for scholars, practitioners, policy makers, educators, and advocates to stay abreast of the latest intergenerational research, practice methods and policy initiatives. This is the only peer-reviewed journal focusing on the intergenerational field integrating practical, theoretical, empirical, familial, and policy perspectives. Papers published in the journal address intergenerational relationships, programs, theory and research that frame and inform our understanding of relationships among members of non-adjacent, "skipped", generations.
(https://www.tandfonline.com/action/journalInformation?show=aimsScope&journalCode=wjir20)

Personal Contribution

Conceptualization: 100%; Methods: 100%; Formal analyses: 100%; Investigation: 100%; Data curation: 100%; Writing - 1st draft: 100%; Writing - review and editing: 85%; Visualization: 100%

Publication B: Old for Young- Cross-National Examination of Intergenerational Political Solidarity

de Paula Sieverding, T., Merten, M., & Kastner, K. (2023). Old for young: Cross-national examination of intergenerational political solidarity. *Group Processes & Intergroup Relations*, *0*(0) 13684302231201785. https://doi.org/10.1177/13684302231201785

Abstract

Socio-ecological crises, such as the climate crisis, place a heavy burden on young and future generations. However, these generations have less influence on political and economic decisions. Older generations will be less affected by most socio-ecological crises but have a greater impact in terms of contribution and resolution. Therefore, young and future generations depend on older generations to act in solidarity. In a preregistered online survey study, we examined the political solidarity of older adults with young people in three countries (N = 399 US-Americans, N = 401 Germans, and N = 403 Brazilians). Results show that affinity with young people and legacy motivation directly explained intergenerational political solidarity in all three countries. In the US and Brazil, quantity and quality of intergenerational contact with young people indirectly explained political solidarity through affinity. These findings suggest that increasing the immediacy between generations may be a promising lever for intergenerational solidarity.

Keywords: intergenerational solidarity, political solidarity, contact theory, affinity, legacy motivation

1. Introduction

The world is currently facing multiple large-scale crises, including the climate crisis and the COVID-19 pandemic (Wallis et al., 2022). In addition to other characteristics, for example place of residence, generational affiliation influences how strongly one is affected by these crises. Young and future generations are expected to be among the most vulnerable in the climate crisis (IPCC, 2022). Belonging to a particular generation also determines how much influence one has in coping with and addressing the respective crisis. The effect of generational affiliation on affectedness and power is often inverse. While, among those alive today, young adults are among the groups most affected by future climate crisis impacts, such as droughts and extreme weather events, they have relatively little say in political decisions to mitigate the climate crisis (Hartmann, 2021; IPCC, 2022). On the other hand, older generations, who are likely to experience fewer negative climate crisis impacts, are more numerous in the electorate and occupy most of the critical positions in politics and business (Hartmann, 2021). For these older adults, there is a lack of immediacy between their behavior and its consequences- both socially (consequences may affect others) and temporally (consequences may unfold in the future; Hurlstone et al., 2020; Wade-Benzoni, 2019; Wade-Benzoni, 2008). This social and temporal distance can lead to what is known as intergenerational discounting, a devaluation of benefits and harms of today's phenomena and actions that accrue to future others (Syropoulos & Markowitz, 2021a; Wade-Benzoni, 2019; Wade-Benzoni, 2008). In our understanding, this would also entail devaluing future consequences that will affect today's younger generations.

Overcoming this barrier of intergenerational discounting is crucial to managing large-scale crises. Today's generations must act now and behave in the best interest of young and future generations, potentially sacrificing rather than benefitting personally. In short: they must act in intergenerational solidarity. There are different understandings and definitions of both solidarity and intergenerational solidarity.

Intergenerational solidarity can be considered a subtype of intergroup relations and solidarity (Sánchez et al., 2010). Early research on intergenerational solidarity focuses on the micro-social level, that is, families and individuals (Bengtson & Oyama, 2010). Within this approach, Bengtson and colleagues define intergenerational solidarity as cohesiveness among different generations within a family (Bengtson et al., 1976).

The second level of analysis of intergenerational solidarity examines society and groups. It focuses on different age groups, understood as age cohorts (e.g., the youth and the elderly; Ryder, 1965). McQuilkin's index of national levels of intergenerational solidarity falls within this approach, defining intergenerational solidarity as "investments or sacrifices that are

intended to increase or sustain the well-being of future generations", and measuring indices such as carbon footprint and forest degradation rate (McQuilkin, 2018). Accordingly, Wade-Benzoni (2019) understands intergenerational beneficence (or solidarity as we call it) as making sacrifices in the present for the benefit of future others (p. 4).

This study examines political solidarity, which can be understood as "allyship with a minority outgroup, a connection to their cause, and a commitment to working with them to achieve social change" (Neufeld et al., 2019b, p. 726). Our focus is on older people, hereafter understood as people of age 55 and older, who have an undeniable impact on many crises, both in terms of contribution and resolution. The goal was to identify factors that could motivate these older people to advocate for and act in the interest of younger generations. To this end, we drew on theories and empirical evidence on how to reduce the psychological distance and increase the immediacy between actors and both recipients and consequences of their behaviors. We aimed at studying intergenerational political solidarity and potential motivators across countries that differ in their social, cultural, economic, and environmental framework conditions.

2. Theory

One of the most prominent approaches on how to reconcile different groups' positions is Allport's intergroup contact theory (1954). It postulates that, under optimal conditions, contact between groups can improve intergroup attitudes and behaviors. A large body of evidence supports the theory, showing, for example, that intergroup contact can yield an increased willingness to help members from other groups (e.g., Johnston & Glasford, 2018). The concept of affinity, which combines empathic concern, perspective-taking, and perceived oneness, has the potential to reduce the perceived psychological distance between todays' actors and potentially affected persons (Wade-Benzoni, 2008). Several studies suggest that affinity with future others enhances intergenerational beneficence and solidarity. To increase the perceived immediacy of consequences of one's behavior that could unfold and affect future others, the motivation to leave a positive legacy offers a promising concept (Hurlstone et al., 2020; Wade-Benzoni, 2019; Zaval et al., 2015). In the following section, the concepts of intergroup contact, affinity, and legacy motivation and their potential role for motivating intergenerational solidarity are presented in more detail.

2.1 Intergroup Contact

Intergroup contact is being considered one of the key mechanisms for improving intergroup attitudes and behaviors and promoting prosocial behavior between groups (e.g., Allport, 1954; Pettigrew & Tropp, 2006a; Williams, 1947). Allport's intergroup contact theory (1954) posits that under optimal conditions, such as equal group status, contact between groups has the potential to reduce intergroup prejudice. In their meta-analytical test of the theory, Pettigrew and Tropp (2006a) combined 515 studies from a variety of contact settings and samples. The results suggest that intergroup contact tends to reduce intergroup prejudice (mean r = -.215) and that this positive effect generalizes to the entire outgroup. Intergroup contact has been shown to improve not only attitudes but also behaviors between groups. In a large-scale test of the relationship between intergroup contact and support for social change, Hässler et al. (2020) found that intergroup contact was positively related to the willingness to work in solidarity across both advantaged and disadvantaged groups. Accordingly, two studies from Johnston and Glasford (2018) suggest that high-quality intergroup contact is associated with an increased commitment to help an outgroup.

Their study shows an important distinction between the quality ("the degree to which contact is positive and cooperative", p.1186) and quantity ("the frequency with which a person comes into contact with an outgroup", p. 1186; Johnston & Glasford, 2018) of intergroup contact. Researchers agree that the quality of contact is more important than the sheer frequency or quantity of contact for improving intergroup attitudes and behaviors (e.g., Islam & Hewstone, 1993). While some studies show a positive (albeit smaller) effect of quantity of contact on intergroup attitudes and behaviors (see, e.g., Brown et al., 2007; De Coninck et al., 2021; Islam & Hewstone, 1993), others found no effect of quantity on, for example, helping behavior toward the outgroup (e.g., Johnston & Glasford, 2018; Schwartz & Simmons, 2001).

The intergroup contact theory has already been tested in an intergenerational context. Pettigrew and Tropp's (2006a) meta-analytic study revealed that contact with older adults reduced prejudice toward them with a mean effect size of r = -.181. In an experimental study, Meshel and McGlynn (2004) examined the effect of a cross-age program on attitudes and stereotypes toward members of another generation. After the six-week contact program, both adolescents and elders from the experimental group reported improved attitudes toward the other generation, whereas the control group showed no change in attitudes. Consistent with findings from research on other target groups (Johnston & Glasford, 2018), Bousfield and Hutchinson's (2010) cross-sectional study shows that quality, but not quantity, of intergenerational contact was positively associated with young people's attitudes and behavioral

intentions (e.g., to help in a situation of need) toward older people. In three studies, Drury et al. (2016) provided further evidence that the quality but not quantity of intergenerational contact has the potential to improve attitudes towards older adults. Accordingly, Kwong and Yan (2021) reported that high-quality intergenerational contact led to improved attitudes and more prosocial behavior intentions toward older people among young adults.

Based on the intergroup contact theory and the empirical results presented, we hypothesize that both quality and quantity of contact with young adults should be positively associated with participants' political solidarity toward younger people, although the effects of quantity may be smaller and more difficult to find.

2.2 Affinity

Several scholars have explored possible pathways through which contact between different groups improves intergroup attitudes and behaviors. Variables such as empathy (e.g., Johnston & Glasford, 2018; Pettigrew & Tropp, 2008), perspective-taking (e.g., Aberson & Haag, 2007; Pettigrew & Tropp, 2008), identification with a shared social group (Römpke et al., 2019), and inclusion of the outgroup in the self (Cadieux et al., 2019) have been shown to be promising mediators. These variables have in common that they reduce the perceived psychological distance between the members of the different groups. Wade-Benzoni and Plunkett Tost (2009) combine these variables under the concept of affinity, which they define as the extent to which a person feels empathetic and connected to others. Affinity combines the variables of empathy (capacity to resonate with the feelings of others; Singer & Klimecki, 2014), perspective-taking ("cognitive capacity to draw inferences about other peoples' beliefs, intentions and thoughts"; Singer & Klimecki, 2014, p. R875), and perceived oneness (or perceived self-other overlap, the extent to which an individual perceives someone else as a part of him or herself; Aron et al., 1992). We are aware of the extensive research on these variables and their interrelationships (e.g., Coke et al., 1978; Davis, 1980; Galinsky & Moskowitz, 2000). In the present study, however, we focus on affinity as a combination of these constructs in accordance with Wade-Benzoni and Plunkett Tost (2009) and its role for intergenerational solidarity.

When an individual feels affinity with and thus closer to another person, that person's interests are assumed to align more with the individuals' self-interests. In turn, psychological distance and discounting are said to decrease and the likelihood of intergenerational beneficence or - as we call it - solidarity are said to increase (Wade-Benzoni, 2019; Wade-Benzoni & Plunkett Tost, 2009). This hypothesis is supported by results from an experimental study on

intergenerational decision-making (Wade-Benzoni, 2008). Results show that the more affinity decision-makers expressed for future generations, the more willing they were to reduce their hypothetical fish consumption for the benefit of future generations of fishers, even if thar decision reduced their personal benefits.

In addition, a number of studies have examined the role of the three individual components of affinity in prosocial behaviors. Empathy has shown to promote prosocial behaviors even when they are associated with personal costs (see, e.g., Davis et al., 1994 for a review) or are directed toward an outgroup (Batson et al., 2002; Taylor & Glen, 2020). Perspective-taking has been shown to be a predictor of sustainable decision-making (Shahen et al., 2021) and the willingness to help outgroup members (Mashuri et al., 2013). Perceived oneness has repeatedly been shown to positively predict the willingness to help (Cialdini et al., 1997; Maner et al., 2002) and actual helping behavior (Ahn et al., 2013).

Based on the theories and empirical evidence presented, we expect participants' affinity with young people to be positively related to their intergenerational political solidarity. We furthermore anticipate that affinity partially mediates the effects of quality and quantity of intergenerational contact on intergenerational political solidarity.

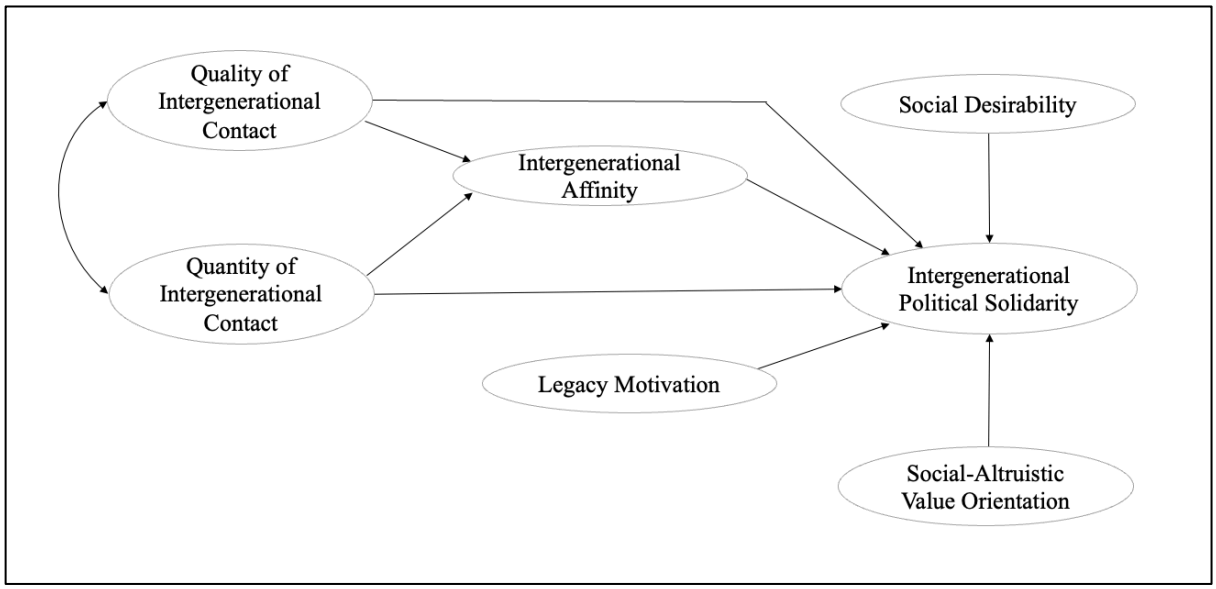
2.3 Legacy Motivation

The older people get, the more their looks into the future are associated with the question of what to pass on to young and future generations (Erikson, 1963). This desire to have an impact that will outlast one's lifespan and to build a positive legacy is defined as legacy motivation (Hurlstone et al., 2020; Wade-Benzoni, 2019). Legacy motivation has shown to be a key mechanism for reducing intergenerational discounting and promoting intergenerational beneficence by making the consequences of one's behavior for future others more immediate and relevant to one's self (Wade-Benzoni et al., 2010). The role of legacy motivation is often studied in environmental contexts, as nature conservation can be viewed as an act for future generations (Zaval et al., 2015). Zaval et al. (2015) confirmed the relationship between domain-general legacy motivation and pro-environmental beliefs, intentions, and behavior. They furthermore primed participants' legacy motivation through an essay-writing task and discovered positive effects of legacy motivation on pro-environmental beliefs, intentions, and behaviors. Accordingly, activating the legacy motivation (e.g., by promoting death awareness) has been shown to reduce intergenerational discounting, leading to increased intergenerational cooperation in a climate change public goods game (Hurlstone et al., 2020).

We therefore hypothesize that participants' legacy motivation might reduce intergenerational discounting and therefore should be positively related to their intergenerational political solidarity. See Figure B.1 for the postulated Structural Model.

Figure B.1

Postulated Structural Model



Note. Ellipses represent latent variables.

2.4 Control Variables

2.4.1 Social Desirability

The construct of social desirability refers to the "the tendency to give overly positive self-descriptions" (Paulhus, 2017, p. 50) and is of particular relevance when assessing behaviors through self-reports that are considered as socially desirable, such as the present concept of intergenerational solidarity. Therefore, we control for a possible effect of participants' social desirability on their self-reported intergenerational political solidarity.

2.4.2 Social-Altruistic Value Orientation

Based on Stern and colleagues' (1999) Value-Belief-Norm Theory of support for social movements, we assume that intergenerational political solidarity may also be guided by a person's values, and in particular motivated by his or her social-altruistic values, and therefore control for these. A large body of research confirms the role of social-altruistic values in prosocial and pro-environmental behavior (e.g., Cameron et al., 1998; Hilbig et al., 2014; Stern et al., 1999).

3. Methods

The present study was designed and conducted in accordance with the APA guidelines for the ethical conduct of research. According to German Law, survey studies do not require ethical approval if anonymity is guaranteed and no sensitive contents are assessed. Furthermore, informed consent was obtained from all participants. The study was pre-registered (see https://aspredicted.org/JG5_TKF).

3.1 Pretest

Prior to the main survey, a pretest was carried out to test the survey on members of the target group (> 54-year-olds from the US, Germany, and Brazil) to evaluate reliability and validity of the scales. Pretest data were collected online from August 16th, to October 5th, 2022 using a convenience sample. Of the $N = 60$ participants who finished the survey, 39 lived in Germany, 8 in the United States of America, and 13 in Brazil. Participants' age ranged from 54 to 80 years ($M = 65.28$, $SD = 6.57$). 48.3% were male, 51.7% female. Based on the results, reverse-coded items were excluded from three scales to increase scale reliability.

3.2 Data Collection and Participants

Data for the main study were collected online by the access panel provider CINT from November 9th, to December 30th, 2022, the United States, Germany, and Brazil using the survey platform SoSciSurvey. Participants were financially compensated by the panel provider (they received about €2 for their participation).

Since the postulated models were to be tested using Structural Equation Modeling, we aimed to double the minimum sample size of $N = 200$ per country suggested by Kline suggestion (Kline, 2011). 1,404 people completed the survey. 186 participants were excluded due to incorrect responses to the screen question ("This is a test question. Please tick 1: "strongly disagree"."), nine were excluded based on mechanical answer tendencies, and one person was excluded based on answers to open-ended questions. Average answer time was 8.96 ($SD = 3.83$) minutes (US: $M = 8.70$, $SD = 3.65$; Germany: $M = 7.24$, $SD = 2.86$; Brazil: $M = 10.93$, $SD = 3.96$). The final sample consisted of $N = 1,203$ persons aged 55 and older, of whom $N = 399$ were from the US, $N = 401$ from Germany, and $N = 403$ from Brazil. To achieve representativeness for each country, we drew on public records regarding the assessment and distribution of age, gender, and education (USA: National Center for Education Statistics (2021); Germany: Statistisches Bundesamt (2020); Brazil: OECD (2022)). For the variables age and education, we merged the answers into groups, e.g., low, medium, and high education. We only allowed for minor deviations from the reported representative distributions. The samples

were representative of each country in terms of gender and age. An attempt was made to obtain samples representative for education as well. However, for all three countries, and especially for Brazil, the lowest level of education (no secondary education) was not adequately represented in the accessible panel (in Brazil, almost half of those aged 54 and older have no secondary education level; see Tables B.B1, B.B2, and B.B3 in Appendix B.B for the distribution of the highest education levels in each sample).

The US sample consisted of 186 males and 213 females. Age ranged from 55 to 88 years (M = 65.12, SD = 6.18). The German sample consisted of 185 males and 216 females. Age ranged from 55 to 87 years (M = 65.06, SD = 6.10). The Brazilian sample consisted of 187 males and 214 females; two participants chose the option "diverse". Age ranged from 55 to 87 years (M = 64.03, SD = 6.31).

3.3 Measures

All items and answer scales can be found in Appendix B.A (Table B.A1). Separate scale reliabilities for each country can be found in Table B.1.

3.3.1 Predictor Variables

Quality of intergenerational contact was measured with five items adapted from Islam and Hewstone (1993) and Lolliot et al. (2015). Participants were asked to what extent they experienced contact with young people in certain ways, e.g., as equal. Answers were assessed on a seven-point Likert scale ranging from 1 (not at all) to 7 (very). The scale had a reliability of Cronbach's α = .89.

Quantity of intergenerational contact was measured with seven items adapted from Islam and Hewstone (1993) and Lolliot et al. (2015). Participants were asked how much contact they had with young people in various settings, e.g., as neighbors or as family members. Answers were assessed on a seven-point Likert scale ranging from 1 (none at all) to 7 (a great deal). Participants were given the option "not applicable". The item inquiring about the contact quantity at work had to be excluded since 194 participants from Germany, 206 from the US, and 124 from Brazil chose the option "not applicable". The scale had a reliability of Cronbach's α = .89.

Affinity toward young people was assessed inspired by Wade-Benzoni (2008) and included the three scales *empathic concern*, *perspective-taking*, and *perceived oneness*. The scale had a reliability of Cronbach's α = .93.

Empathic concern was assessed using six items drawn from Batson (1987). Participants were asked to describe how strongly they felt six emotions toward young people, e.g., sympathetic and compassionate. Answers were assessed on a 7-point Likert scale ranging from 1 (not at all) to 7 (a great deal).

Perspective-taking was assessed with three items (e.g., "It is easy for me to put myself in the shoes of young people.") adapted from Batson and Ahmad (2009) on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Perceived oneness was assessed with two items. Participants were presented with the Inclusion of Others in Self Scale drawn from Aron et al. (1992) depicting seven Venn diagrams, and were asked to select the graph that best described their relationship with young people. They were furthermore asked to indicate the extent to which they would use the term "we" to describe themselves and young people (Cialdini et al., 1997). The answer was assessed on a seven-point Likert scale ranging from 1 (not at all) to 7 (extremely).

Legacy motivation was assessed with four items following Wade-Benzoni et al. (2010) and Zaval et al. (2015). Items were, for example, "It is important to me to leave a positive legacy for young generations.". Answers were assessed on a 7-point Likert scale ranging from 1 (none at all) to 7 (a great deal). The scale had a reliability of Cronbach's $\alpha = .83$. The reliability would have increased to .92 if the item "It is important to me to avoid leaving a negative legacy for young generations." would have been dropped. However, the item was not excluded because it covers an important aspect of legacy motivation (Wade-Benzoni et al., 2010).

3.3.2 Criterion

Political solidarity with young people was assessed by drawing and revising items from Shnabel et al. (2016), Stern et al. (1999), Neufeld et al. (2019a) and Hässler et al. (2020) and supplemented with two new items. Items were, for example, "Young people should obtain more power in the decision-centers of our society." and "I would be willing to accept cuts in my standard of living to ensure a good future for young people.". Answers were assessed on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The scale had a reliability of Cronbach's $\alpha = .90$.

3.3.3 Control Variables

Social desirability was measured with three items adapted from Kemper et al. (2012). Participants were asked to indicate the extent to which the statements applied to them (e.g., "In an argument, I always remain objective and stick to the facts."). Answers were assessed on a 5-

point Likert scale ranging from 1 (doesn't apply at all) to 5 (applies completely). The scale had a reliability of Cronbach's α = .70.

Social-altruistic value orientation (short: social-altruistic values) was measured using three items from Stern's (1998) Brief Inventory of Values. Participants were asked to which extent they considered three values (e.g., "social justice, correcting injustice, care for the weak") as guiding principles in their lives. Answers were assessed on a 9-point Likert scale ranging from -1 (opposed to my values) over 0 (not important) to 7 (of supreme importance). The scale had a reliability of Cronbach's α = .82.

3.4 Planned Statistical Analyses

Prior to analyzing and comparing the postulated model in the three countries, measurement invariance was tested using Multi-Group Confirmatory Factor Analysis (MG-CFA). A Multiple-Group Structural Equation Model was then computed to test the predicted model in the three countries using the lavaan package in R (Rosseel, 2012). Since the criterion (intergenerational political solidarity) was not normally distributed, MLR (Maximum Likelihood Robust, with Huber-White correction of standard errors and a Yuan-Bentler equivalent test statistic) was used as a robust estimator. Given the use of a robust estimator, no bootstrapping technique was used. Missing values were excluded case-wise (only existent for the variable quantity of intergenerational contact). Because we had a fairly large sample, we report χ^2 -values for descriptive purposes only as they are sensitive to small deviations in large samples (Bentler & Bonett, 1980; Fischer & Karl, 2019). Instead, we use goodness-of-fit indices to assess model fits (Chen, 2007; Fischer & Karl, 2019).

4. Results

4.1 Descriptive Statistics and Bivariate Correlations

Table B.1 shows the means, standard deviations, and scale reliabilities of the central variables for each country. Means, standard deviations, and bivariate correlations for the three countries combined can be found in Table 2. Separate bivariate correlations for each country can be found in Appendix B.C (Tables B.C1, B.C2, and B.C3). Because the scales of interest (predictor variables, control variables, criterion) were not normally distributed, Spearman's Rho was used to assess the bivariate correlations.

When examining the descriptive statistics and comparing them across the three countries, the pattern of mean values stands out most. For all variables, mean values were lowest for the US participants and highest for the Brazilian participants (see Appendix B.C Figure

B.C1 for a visual representation of the means and standard errors of the means for each country). Social-altruistic values were relatively high in all three countries.

Table B.1

Means, Standard Deviations and Scale Reliabilities in the US, Germany, and Brazil

		USA	Germany	Brazil
Contact Quality (Scale: 1 to 7)	*M*	4.49	5.25	5.38
	SD	1.33	1.36	1.28
	α	.87	.95	.91
Contact Quantity (Scale: 1 to 7)	*M*	4.35	4.37	5.42
	SD	1.46	1.46	1.29
	α	.91	.89	.91
Affinity (Scale: 1 to 7)	*M*	4.65	5.05	5.42
	SD	1.23	1.09	1.11
	α	.93	.93	.93
Legacy Motivation (Scale: 1 to 7)	*M*	5.37	5.51	6.02
	SD	1.34	1.33	1.08
	α	.88	.93	.63
Social Desirability (Scale: 1 to 5)	*M*	4.05	4.17	4.26
	SD	0.68	0.68	0.68
	α	.66	.77	.66
Social-Altruistic Values (Scale: -1 to 7)	*M*	5.59	6.00	6.45
	SD	1.51	1.16	1.00
	α	.81	.80	.83
Political Solidarity (Scale: 1 to 7)	*M*	4.27	4.53	5.24
	SD	1.31	1.22	1.12
	α	.91	.90	.86

The correlations between the potential motivators (quality and quantity of contact, affinity, legacy motivation), the control variables (social desirability, social-altruistic value

orientation) and the criterion intergenerational political solidarity all pointed in the predicted directions (see Table B.2). When considering the three countries together, age was, as one could expect, negatively related to the reported quality and quantity of contact and affinity with younger people. It showed no significant relationship with legacy motivation, but a negative one with intergenerational political solidarity. Identifying as female was positively associated with all variables studied. The strongest bivariate correlations of intergenerational political solidarity were found with affinity and legacy motivation.

Table B.2

Means, Standard Deviations, and Bivariate Correlations in the Three Countries Combined

		Age	Gender	Contact Quality	Contact Quantity	Affinity	Legacy Motivation	Social Desirability	Social-Altruistic Values	Political Solidarity
	M	64.73		5.04	4.49	5.04	5.63	4.16	6.01	4.68
	SD	6.21		1.38	1.40	1.19	1.28	1.29	1.29	1.29
Gender	r_s	-.11**	--							
Contact Quality	r_s	-.08**	.13**	--						
Contact Quantity	r_s	-.19**	.10*	.68**	--					
Affinity	r_s	-.07*	.13**	.72**	.66**	--				
Legacy Motivation	r_s	-.02	.15**	.48**	.43**	.65**	--			
Social Desirability	r_s	.04	.04	.35**	.33**	.38**	.36**	--		
Social-Altruistic Values	r_s	-.02	.12**	.37**	.32**	.49**	.48**	.33**	--	
Political Solidarity	r_s	-.06*	.06*	.51**	.48**	.65**	.55**	.22**	.45**	--

Note. Spearman's Rho was used to assess the correlations. * $p < .05$. ** $p < .01$. *** $p < .001$.

4.2 Measurement Invariance Test

First, we checked for measurement invariance across the three countries using Multi-Group Confirmatory Factor Analysis (MG-CFA). We used the delta-fit heuristics to identify potential losses in model fit performances when applying configural, metric, and scalar measurement invariance. We compared the fit indices of three models that assumed different levels of measurement invariance: 1) configural measurement invariance (imposing the same factor structure on all three countries, but not equal factor loadings and item intercepts), 2) metric measurement invariance (imposing same factor structure and equal factor loadings but not item intercepts), 3) scalar measurement invariance (imposing same factor structure, and equal factor loadings and item intercepts). Results indicate that metric measurement invariance was present (Δ *Robust CFI* = .006, Δ *Robust RMSEA* = -.001, Δ *SRMR* = -.018).

In a next step, we tested for partial scalar measurement invariance by freeing only certain item intercepts (based on modification indices) while retaining fixed factor loadings and the same factor structure for the three countries. By freeing four of the 42 item intercepts (see highlighted items in Appendix B.A Tables B.A1, B.A3, and B.A4), the model fit improved from *Robust CFI* = .884 to .904, *Robust RMSEA* from .063 to .057, and *SRMR* from .082 to .075, reducing the differences in fit indices below the acceptable threshold suggested by Chen (2007; Δ CFI <=.01, Δ RMSEA <=.015, Δ SRMR <=.01). We therefore consider the model to be partially scalar measurement invariant across the three countries, allowing for intergroup comparisons (Borsboom, 2006; Steenkamp & Baumgartner, 1998).

4.3 Structural Equation Model

Multi-Group Structural Equation Modeling (MG-SEM) with MLR als estimator was used to test the postulated model. Across the three countries, the postulated model had a decent fit (Robust CFI = .90, Robust TLI = . 90, Robust RMSEA = .06; Hu & Bentler, 1999).

4.3.1 United States of America

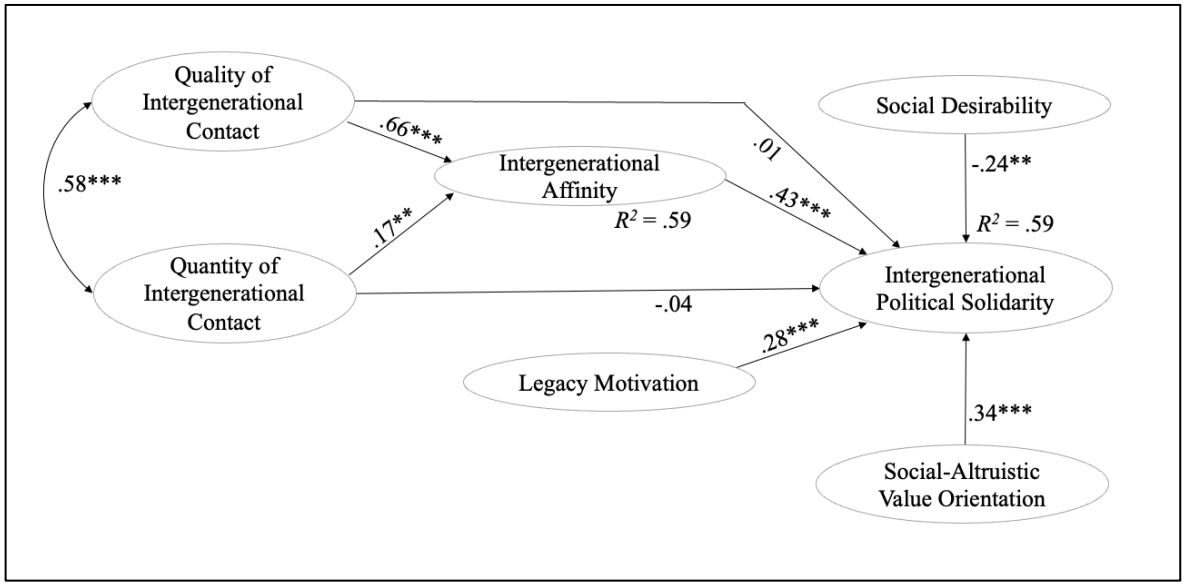
The model explained 59.1% of the variance in the criterion intergenerational political solidarity among US-participants (see Figure B.2, see Appendix B.D, Figure B.D1 for Measurement Model and Structural Model). Participants' intergenerational affinity was explained by the quality (β = .66, 95% CI [.54, .77], $p < .001$) and quantity (β = .17, 95% CI [.05, .29], $p = .007$) of the intergenerational contact they reported to have with young people. When inspecting the confidence intervals of the standardized regression coefficients, one can see that the association of affinity with contact quality was significantly higher than its association with contact quantity. The two intergenerational contact measures were significantly

correlated (r = .58, 95% CI [.50, .67], p < .001). Participants' affinity with young people significantly explained their intergenerational political solidarity (β = .43, 95% CI [.26, .59], p < .001) and emerged as the strongest predictor. Both quality (β = .01, 95% CI [-.16, .18], p = .92) and quantity (β = -.04, 95% CI [-.17, .08], p = .48) of intergenerational contact did not significantly explain the criterion directly, but indirectly explained it through affinity (quality: β = .28, 95% CI [.15, .41], p < .001; quantity: β = .07, 95% CI [.02, .11], p = .01. Legacy motivation significantly explained the criterion with β = .28 (95% CI [.13, .41], p < .001).

The control variables significantly explained the criterion (social desirability: β = -.24, 95% CI [-.38, -.10], p = .001, social-altruistic value orientation: β = .34, 95% CI [.20, .48], p < .001), with the effect of social desirability pointing in the direction opposite to the prediction.

Figure B.2

Structural Model Predicting Intergenerational Political Solidarity in the US



Note. N = 399. Ellipses represent latent variables. Displayed are standardized regression coefficients and bivariate correlations. * p < .05. ** p < .01. *** p < .001.

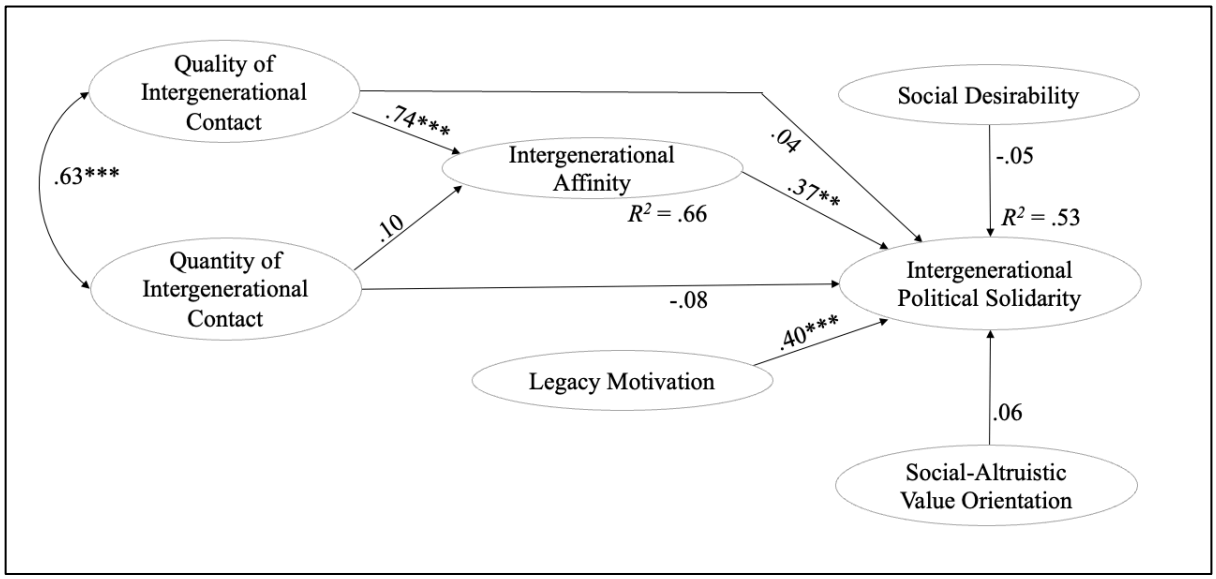
4.3.2 Germany

The model explained 52.5% of the variance in the criterion political solidarity among Germans (see Figure B.3, see Appendix B.D, Figure B.D2 for Measurement Model and Structural Model). Participants' affinity with young people was significantly explained by the quality (β = .74, 95% CI [.65, .84], p < .001) but not quantity (β = .10, 95% CI [-.02, .22], p = .09) of intergenerational contact. The quality and quantity of intergenerational contact were positively related (r = .63, 95% CI [.55, .72], p < .001). Neither of the two intergenerational contact measures had a direct effect on intergenerational political solidarity (quality: β = .04,

95% CI [-.13, .20], p = .64, quantity: β = -.08, 95% CI [-.20, .05], p = .22). The quality of intergenerational contact indirectly explained the criterion through affinity, yet the quantity of contact did not (quality: β = .28, 95% CI [.11, .44], p = .001; quantity: β = .04, 95% CI [-.01, .08], p = .11). As hypothesized, participants' intergenerational political solidarity was predicted by their affinity with young people (β = .37, 95% CI [.16, .59], p = .001) and their legacy motivation (β = .40, 95% CI [.22, .57], p < .001). Neither of the control variables explained the criterion (social desirability: β = -.05, 95% CI [-.20, .11], p = .56; social-altruistic value orientation: β = .06, 95% CI [-.07, .18], p = .40).

Figure B.3

Structural Model Predicting Intergenerational Political Solidarity in Germany



Note. N = 401. Ellipses represent latent variables. Displayed are standardized regression coefficients and bivariate correlations. * p < .05. ** p < .01. *** p < .001.

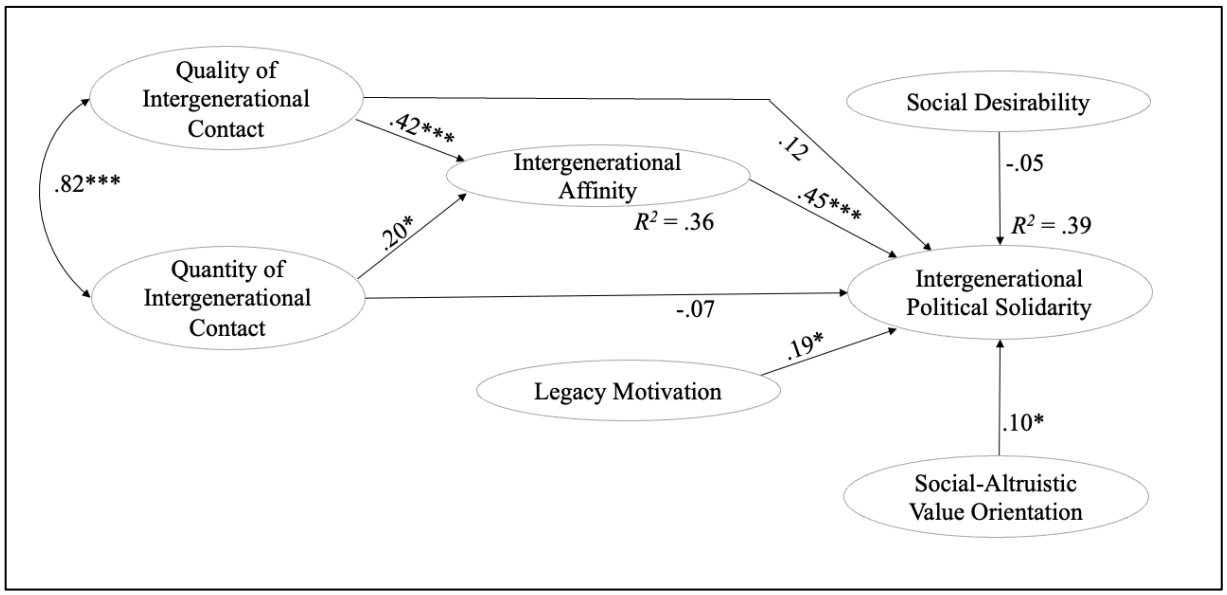
4.3.3 Brazil

The model explained 38.9% of the variance in the criterion political solidarity among Brazilians (see Figure B.4, see Appendix B.D, Figure B.D3 for Measurement Model and Structural Model). The quality (β = .42, 95% CI [.26, .58], p < .001) and quantity (β = .20, 95% CI [.03, .37], p = .12) of intergenerational contact significantly explained participants' affinity with young people. The quality and quantity of intergenerational contact were again positively related (r = .82, 95% CI [.76, .88], p < .001). Neither of the contact measures directly explained the criterion (quality: β = .12, 95% CI [-.04, .28], p = .15; quantity: β = -.07, 95% CI [-.20, .06], p = .29). However, both quality (β = .19, 95% CI [.10, .28], p < .001) and quantity (β = .09, 95% CI [.01, .17], p = .03) of intergenerational contact indirectly explained the criterion through

affinity. Intergenerational political solidarity was again predicted by participants' affinity with young people (β = .45, 95% CI [.30, .60], $p < .001$) and legacy motivation (β = .19, 95% CI [.001, .38], $p = .048$). While social desirability was not related to the criterion (β = -.05, 95% CI [-.18, .08]), $p = .46$, social-altruistic value orientation did significantly explain participants' intergenerational political solidarity (β = .10, 95% CI [.004, .20], $p = .04$).

Figure B.4

Structural Model Predicting Intergenerational Political Solidarity in Brazil



Note. N = 403. Ellipses represent latent variables. Displayed are standardized regression coefficients and bivariate correlations. * $p < .05$. ** $p < .01$. *** $p < .001$.

5. Discussion

The world is currently facing a multitude of large-scale crises. Although the full consequences of some of these crises will only unfold in the future, it is essential that today's generations take action. Groups with greater influence need to lend their voices to those more affected and less heard. Our aim was to postulate a model that could successfully explain older adults' intergenerational political solidarity in different countries.

5.1 Predicting Intergenerational Political Solidarity

When conducting cross-national research, it is crucial that cross-country comparisons are actually valid. Since partial scalar measurement invariance was ensured, we were able to interpret and compare the results of the structural equation model test across the three countries.

The postulated model had a decent fit across the three countries, and explained between 38.9% (Brazil) to 59.1% (USA) of the variance in the criterion of intergenerational political

solidarity. As hypothesized, and consistent with previous evidence on the facilitating role of intergenerational affinity for intergenerational beneficence (Wade-Benzoni, 2008), affinity with younger people significantly explained the intergenerational political solidarity among US-Americans, Germans, and Brazilians. We therefore assume that higher levels of empathy, perspective-taking, and perceived oneness with young people could be negatively associated with psychological distance and intergenerational discounting, and in turn positively related to behaviors that benefit young people without entailing personal benefits or even sacrifices for the older people.

Furthermore, our results confirm the mixed evidence on the role of intergroup contact: The quality of intergenerational contact showed a consistent positive and strong relationship with the affinity with younger people across the three countries, and thus might be a promising lever to increase connectedness between different generations. However, our results on the role of the contact quantity are mixed. Although quantity of contact was positively related to intergenerational affinity among US-Americans and Brazilians, this relationship was significantly smaller than the relationship between affinity and contact quality. Moreover, the relationship between contact quantity and affinity did not prove significant among Germans.

In the US and in Brazil, the indirect effects of contact quality and quantity on the criterion mediated through affinity turned out significant. The indirect effects of the quality of contact were considerably larger than the indirect effect of contact quantity. In Germany, only the quality of intergenerational contact showed an indirect effect on participants' intergenerational political solidarity through affinity. These findings are consistent with previous research, which unanimously points out the dominant role of the quality of intergroup contact for improving intergroup attitudes and behaviors, and the mixed evidence on the role of the quantity of contact (see, e.g., Drury et al., 2016 for intergenerational contact; Islam & Hewstone, 1993 for interreligious contact). We can therefore assume that an increase in particularly the quality of contact with younger people is related to an increase in the affinity experienced with them, which in turn is positively associated with intergenerational political solidarity among older adults. However, when interpreting the indirect effects of both quality and quantity of intergenerational contact, one has to keep in mind their high intercorrelation in all three countries.

As initially discussed, intergenerational solidarity can be hindered both by the social distance from the people affected by one's decisions as well as by the temporal distance between decision-makers and the consequences of their decisions. Consistent with previous research

(e.g., Hurlstone et al., 2020), legacy motivation was associated with higher levels of intergenerational political solidarity in all three countries. While our study focuses on solidarity with people who are younger but already born, this finding is promising when thinking about how to promote solidarity behaviors with people in a more distant future, since leverage points such as contact are not available until the recipients are born.

As desired, our variables predicted intergenerational political solidarity even when controlling for social desirability and social-altruistic value orientation. We wanted to ensure that our results were not only guided by participants giving socially desirable answers. Moreover, our results suggest that, while they are a relevant predictor in the US and Brazilian samples, it takes more than social-altruistic values to explain and promote intergenerational political solidarity. It is also worth noting that the only significant relationship we found between social desirability and intergenerational political solidarity (in the US) was negative. According to Crowne and Marlowe (1964), social desirability is motivated by an individual's need to respond in culturally sanctioned ways. However, cultural norms about what is appropriate vary greatly across cultures and countries (Johnson & Van de Vijver, 2003). Intergenerational political solidarity might have been perceived as more or less socially desirable across the three countries, and perhaps as not socially desirable in the US.

5.2 Limitations

The present study has several shortcomings that must be held in mind when interpreting the results. The correlational design of the study does not allow for causal inferences. Future research should therefore examine the causal relationships between intergenerational contact, affinity and legacy motivation, and intergenerational solidarity.

Great efforts have been made to draw samples that are representative in terms of education. Yet, the panel provider did not succeed in drawing samples representative for the different education levels. While the distribution of education was nearly representative for the US-American and German samples, the same cannot be said for Brazil. According to the OECD, nearly 60% of Brazilians aged 55 to 64 have not completed upper secondary education, i.e., high school, and only about 15% of this age group have completed tertiary education (OECD, 2022). Despite multiple survey rounds, individuals from the lower educational group were not adequately represented.

Combining the three variables of empathy, perspective-taking, and perceived oneness into the variable of affinity can be critically discussed, particularly against the background of existing research on the causal relationship between these variables (see, e.g., Coke et al., 1978;

Galinsky & Moskowitz, 2000) and the overarching issue of in- and outgroups (e.g., Dovidio et al., 2010; Turner, 1975). However, the good internal consistency of the scale and the factor matrix from the CFA support the proposed unidimensionality of the affinity construct as proposed by Wade-Benzoni (2008). Future research, however, could further examine the interaction of these three variables in relation to intergenerational solidarity.

5.3 Implications for Future Research and Practice

The present study applied established theories on how to reduce social and temporal distance and improve intergroup attitudes and behaviors to examine solidarity between generations. While the present study provides preliminary insights into potential motivators of intergenerational political solidarity, further research is needed to examine the causal relationships between the variables of intergenerational contact, affinity, legacy motivation, and political solidarity. Future research should investigate additional pathways through which affinity might be increased. Research from Wade-Benzoni and colleagues (1999; 2008) suggests that thinking of future others as ones offsprings or progenies might increase affinity with these future others, indicating a potential positive relationship between affinity and legacy motivations.

Furthermore, the role of parenthood should be examined in this context, since transitioning into parenthood has shown to motivate environmental engagement through the activation of legacy motives (green parenthood effect; Shrum et al., 2023).

To measure political solidarity directed at younger generations, we combined well-established scales of political solidarity and policy support and actions. Future research could test the scale in other contexts and target groups, as this study shows partial scalar measurement invariance in three different countries.

Our results suggest that, across different countries, there is such a thing as political solidarity with younger generations and a certain willingness to forego personal benefits for the sake of younger people. In all three countries, both affinity with young people as well as legacy motivation emerged as relevant predictors. They could therefore be considered as potential levers to promote intergenerational solidarity, e.g., by initiating intergenerational perspective exchange or by appealing to individuals' impact on future others.

It appears that particularly a high-quality intergenerational contact may improve affinity with younger generations, which in turn may promote intergenerational solidarity. While further research is needed on the causal role of contact in the intergenerational setting, enabling

intergenerational encounters could reduce the perceived distance between generations and increase affinity and thus solidarity.

5.4 Conclusion

To our knowledge, the present study was one of the first to explicitly examine intergenerational political solidarity. In the face of crises such as the climate crisis that entail and affect different generations, it is of utmost importance to promote solidarity with the most affected and least influential generational groups. Findings from three countries suggest that older people are more willing to show political solidarity with younger people when they feel affinity toward them and when they express a higher legacy motivation. High-quality intergenerational contact seems promising for increasing intergenerational affinity, and might indirectly promote intergenerational political solidarity.

Acknowledgements

We thank Lukas Engel for his statistical advice and Laura Kockhans for her formatting assistance.

Funding

This work was supported by the Deutsche Bundesstiftung Umwelt (DBU; grant number: 20020/692).

Declaration of Conflicting Interests

The Authors declare that there is no conflict of interest.

References

Aberson, C. L., & Haag, S. C. (2007). Contact, perspective taking, and anxiety as predictors of stereotype endorsement, explicit attitudes, and implicit attitudes. *Group Processes & Intergroup Relations*, *10*(2), 179-201. https://doi.org/10.1177/1368430207074726

Ahn, S. J., Le, A. M. T., & Bailenson, J. (2013). The effect of embodied experiences on self-other merging, attitude, and helping behavior. *Media Psychology*, *16*(1), 7-38. https://doi.org/10.1080/15213269.2012.755877

Allport, G. W. (1954). *The Nature of Prejudice*. Addison Wesley.

Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, *63*(4), 596. https://doi.org/10.1037/0022-3514.63.4.596

Batson, C. D. (1987). Prosocial motivation: Is it ever truly altruistic? *Advances in Experimental Social Psychology*, *20*, 65-122. https://doi.org/10.1016/S0065-2601(08)60412-8

Batson, C. D., & Ahmad, N. Y. (2009). Using empathy to improve intergroup attitudes and relations. *Social Issues and Policy Review*, *3*(1), 141-177. https://doi.org/10.1111/j.1751-2409.2009.01013.x

Batson, C. D., Chang, J., Orr, R., & Rowland, J. (2002). Empathy, attitudes, and action: Can feeling for a member of a stigmatized group motivate one to help the group? *Personality and Social Psychology Bulletin*, *28*(12), 1656-1666. https://doi.org/10.1177/014616702237647

Bengtson, V., Olander, E., & Haddad, A. (1976). The “Generation Gap" and Aging Family Members: Toward a Conceptual Model. In J. F. Gubrium (Ed.), *Time, Roles, and the Self in Old Age* (pp. 237-263). Hamn Sciences Press.

Bengtson, V. L., & Oyama, P. S. (2010). Intergenerational Solidarity and Conflict. In M. A. Cruz-Saco & S. Zelenev (Eds.), *Intergenerational Solidarity* (pp. 32-52).

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*(3), 588. https://doi.org/10.1037/0033-2909.88.3.588

Borsboom, D. (2006). When does measurement invariance matter? *Medical Care*, *44*(11), S176-S181. https://doi.org/10.1097/01.mlr.0000245143.08679.cc

Bousfield, C., & Hutchison, P. (2010). Contact, anxiety, and young people's attitudes and behavioral intentions towards the elderly. *Educational Gerontology*, *36*(6), 451-466. https://doi.org/10.1080/03601270903324362

Brown, R., Eller, A., Leeds, S., & Stace, K. (2007). Intergroup contact and intergroup attitudes: A longitudinal study. *European Journal of Social Psychology*, *37*(4), 692-703. https://doi.org/10.1002/ejsp.384

Cadieux, J., Chasteen, A. L., & Packer, P., Dominic J. (2019). Intergenerational contact predicts attitudes toward older adults through inclusion of the outgroup in the self. *The Journals of Gerontology: Series B*, *74*(4), 575-584. https://doi.org/https://doi.org/10.1093/geronb/gbx176

Cameron, L. D., Brown, P. M., & Chapman, J. G. (1998). Social value orientations and decisions to take proenvironmental action. *Journal of Applied Social Psychology*, *28*(8), 675-697. https://doi.org/10.1111/j.1559-1816.1998.tb01726.x

Chen, F. F. (2007). Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, *14*(3), 464-504. https://doi.org/10.1080/10705510701301834

Cialdini, R. B., Brown, S. L., Lewis, B. P., Luce, C., & Neuberg, S. L. (1997). Reinterpreting the empathy–altruism relationship: When one into one equals oneness. *Journal of*

Personality and Social Psychology, *73*(3), 481-494. https://doi.org/10.1037/0022-3514.73.3.481

Coke, J. S., Batson, C. D., & McDavis, K. (1978). Empathic mediation of helping: a two-stage model. *Journal of Personality and Social Psychology*, *36*(7), 752-766. https://doi.org/10.1037/0022-3514.36.7.752

Crowne, D. P., & Marlowe, D. (1964). *The approval motive: Studies in evaluative dependence*. New York: Wiley.

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology*, 1-19.

Davis, M. H., Luce, C., & Kraus, S. J. (1994). The heritability of characteristics associated with dispositional empathy. *Journal of Personality*, *62*(3), 369-391. https://doi.org/10.1111/j.1467-6494.1994.tb00302.x

De Coninck, D., Rodríguez-de-Dios, I., & d'Haenens, L. (2021). The contact hypothesis during the European refugee crisis: Relating quality and quantity of (in) direct intergroup contact to attitudes towards refugees. *Group Processes & Intergroup Relations*, *24*(6), 881-901. https://doi.org/10.1177/1368430220929394

Dovidio, J. F., Gaertner, S. L., Schnabel, N., Saguy, T., & Johnson, J. (2010). Recategorization and prosocial behavior. In S. Stürmer & M. Snyder (Eds.), *The Psychology of Prosocial Behavior: Group Processes, Intergroup Relations, and Helping* (pp. 289-309). Wiley-Blackwell.

Drury, L., Hutchison, P., & Abrams, D. (2016). Direct and extended intergenerational contact and young people's attitudes towards older adults. *British Journal of Social Psychology*, *55*(3), 522-543. https://doi.org/10.1111/bjso.12146

Erikson, E. H. (1963). *Childhood and Society*. Norton.

Fischer, R., & Karl, J. A. (2019). A primer to (cross-cultural) multi-group invariance testing possibilities in R. *Frontiers in Psychology*, 1507. https://doi.org/10.3389/fpsyg.2019.01507

Galinsky, A. D., & Moskowitz, G. B. (2000). Perspective-taking: decreasing stereotype expression, stereotype accessibility, and in-group favoritism. *Journal of Personality and Social Psychology*, *78*(4), 708-724. https://doi.org/10.1037/0022-3514.78.4.708

Hartmann, C. (2021). *Young people, climate change and political power: comparing Germany and the UK*. Retrieved 03-24-2023 from https://www.if.org.uk/2021/09/02/young-people-climate-change-and-political-power-comparing-germany-and-the-uk/

Hässler, T., Ullrich, J., Bernardino, M., Shnabel, N., Laar, C. V., Valdenegro, D., Sebben, S., Tropp, L. R., Visintin, E. P., & González, R. (2020). A large-scale test of the link between intergroup contact and support for social change. *Nature Human Behaviour*, *4*(4), 380-386. https://doi.org/10.1038/s41562-019-0815-z

Hilbig, B. E., Glöckner, A., & Zettler, I. (2014). Personality and prosocial behavior: linking basic traits and social value orientations. *Journal of Personality and Social Psychology*, *107*(3), 529. https://doi.org/10.1037/a0036074

Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal 6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Hurlstone, M. J., Price, A., Wang, S., Leviston, Z., & Walker, I. (2020). Activating the legacy motive mitigates intergenerational discounting in the climate game. *Global Environmental Change*, *60*, 102008. https://doi.org/10.1016/j.gloenvcha.2019.102008

IPCC. (2022). *Summary for Policymakers. Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (9291691593).

Islam, M. R., & Hewstone, M. (1993). Dimensions of contact as predictors of intergroup anxiety, perceived out-group variability, and out-group attitude: An integrative model. *Personality and Social Psychology Bulletin*, *19*(6), 700-710. https://doi.org/10.1177/0146167293196005

Johnson, T. P., & Van de Vijver, F. J. (2003). Social desirability in cross-cultural research. In J. A. Harkness, F. J. R. v. d. Vijver, & P. P. Mohler (Eds.), *Cross-Cultural Survey Methods* (Vol. 325, pp. 195-204).

Johnston, B. M., & Glasford, D. E. (2018). Intergroup contact and helping: How quality contact and empathy shape outgroup helping. *Group Processes & Intergroup Relations*, *21*(8), 1185-1201. https://doi.org/10.1177/136843021771177

Kemper, C. J., Beierlein, C., Bensch, D., Kovaleva, A., & Rammstedt, B. (2012). Eine Kurzskala zur Erfassung des Gamma-Faktors sozial erwünschten Antwortverhaltens: Die Kurzskala Soziale Erwünschtheit-Gamma (KSE-G). In: GESIS – Leibniz-Institut für Sozialwissenschaften.

Kwong, A. N., & Yan, E. C. (2021). The Role of Quality of Face-to-face Intergenerational Contact in Reducing Ageism: The Perspectives of Young People. *Journal of Intergenerational Relationships*, *21*(1), 136–151. https://doi.org/10.1080/15350770.2021.1952134

Lolliot, S., Fell, B., Schmid, K., Wölfer, R., Swart, H., Voci, A., Christ, O., New, R., & Hewstone, M. (2015). Measures of intergroup contact. *Measures of Personality and Social Psychological Constructs*, 652-683. https://doi.org/10.1016/B978-0-12-386915-9.00023-1

Maner, J. K., Luce, C. L., Neuberg, S. L., Cialdini, R. B., Brown, S., & Sagarin, B. J. (2002). The effects of perspective taking on motivations for helping: Still no evidence for altruism. *Personality and Social Psychology Bulletin*, *28*(11), 1601-1610. https://doi.org/10.1177/014616702237586

Mashuri, A., Zaduqisti, E., & Supriyono, Y. (2013). Perspective-taking and outgroup helping: The moderating role of warmth impression and outgroup status. *International Journal of Research Studies in Psychology*, *1*(3).

McQuilkin, J. (2018). Doing Justice to the Future: A global index of intergenerational solidarity derived from national statistics. *Intergenerational Justice Review*, *4*(1), 4-21. https://doi.org/10.24357/igjr.12.1.639

Meshel, D. S., & McGlynn, R. P. (2004). Intergenerational contact, attitudes, and stereotypes of adolescents and older people. *Educational Gerontology*, *30*(6), 457-479. https://doi.org/10.1080/03601270490445078

National Center for Education Statistics. (2021). *Number of persons age 18 and over, by highest level of educational attainment, sex, race/ethnicity, and age: 2021*. Retrieved 03-01-2023 from https://nces.ed.gov/programs/digest/d21/tables/dt21_104.30.asp?current=yes

Neufeld, K. H., Gaucher, D., Starzyk, K. B., & Boese, G. D. (2019a). How feeling connected to one's own community can increase support for addressing injustice impacting outgroup communities. *Group Processes & Intergroup Relations*, *22*(4), 530-548. https://doi.org/10.1177/1368430217749881

Neufeld, K. H. S., Starzyk, K. B., & Gaucher, D. (2019b). Political solidarity: A theory and a measure. *Journal of Social and Political Psychology*, *7*(2), 726-765. https://doi.org/10.5964/jspp.v7i2.1058

OECD. (2022). *Brazil*. OECD Publishing. https://doi.org/10.1787/a5ee2d75-en

Paulhus, D. L. (2017). Socially desirable responding on self-reports. In D. L. Paulhus (Ed.), *Encyclopedia of Personality and Individual Differences* (pp. 1-5): Springer.

Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. *Journal of Personality and Social Psychology 90*(5), 751–783. https://doi.org/10.1037/0022-3514.90.5.751

Pettigrew, T. F., & Tropp, L. R. (2008). How does intergroup contact reduce prejudice? Meta-analytic tests of three mediators. *European Journal of Social Psychology*, *38*(6), 922-934. https://doi.org/10.1002/ejsp.504

Römpke, A. K., Fritsche, I., & Reese, G. (2019). Get together, feel together, act together: International personal contact increases identification with humanity and global collective action. *Journal of Theoretical Social Psychology*, *3*(1), 35-48. https://doi.org/10.1002/jts5.34

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling and more. Version 0.5–12 (BETA). *Journal of Statistical Software 48*(2), 1-36

Ryder, N. B. (1965). The Cohort as a Concept in the Study of Social Change. *American Sociological Review*, 43-61.

Sánchez, M., Sáez, J., & Pinazo, S. (2010). Intergenerational Solidarity. In M. A. Cruz-Saco & S. Zelenev (Eds.), *Intergenerational Solidarity* (pp. 129-146). Springer.

Schwartz, L. K., & Simmons, J. P. (2001). Contact quality and attitudes toward the elderly. *Educational Gerontology*, *27*(2), 127-137. https://doi.org/10.1080/03601270151075525

Shahen, M. E., Kotani, K., & Saijo, T. (2021). Intergenerational sustainability is enhanced by taking the perspective of future generations. *Scientific Reports*, *11*(1), 1-11. https://doi.org/10.1038/s41598-021-81835-y

Shnabel, N., Dovidio, J. F., & Levin, Z. (2016). But it's my right! Framing effects on support for empowering policies. *Journal of Experimental Social Psychology*, *63*, 36-49. https://doi.org/10.1016/j.jesp.2015.11.007

Shrum, T. R., Platt, N. S., Markowitz, E., & Syropoulos, S. (2023). A scoping review of the green parenthood effect on environmental and climate engagement. *Wiley Interdisciplinary Reviews: Climate Change*, *14*(2), e818. https://doi.org/10.1002/wcc.818

Singer, T., & Klimecki, O. M. (2014). Empathy and compassion. *Current Biology*, *24*(18), R875-R878. https://doi.org/10.1016/j.cub.2014.06.054

Statistisches Bundesamt. (2020). *Bevölkerung im Alter von 15 Jahren und mehr nach allgemeinen und beruflichen Bildungsabschlüssen nach Jahren*. Retrieved 03-01-2023 from https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bildung-Forschung-Kultur/Bildungsstand/Tabellen/bildungsabschluss.html#fussnote-1-104098

Steenkamp, J.-B. E., & Baumgartner, H. (1998). Assessing measurement invariance in cross-national consumer research. *Journal of Consumer Research 25*(1), 78-90. https://doi.org/10.1086/209528

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. *Human Ecology Review* 81-97.

Stern, P. C., Dietz, T., & Guagnano, G. A. (1998). A brief inventory of values. *Educational and Psychological Measurement 58*(6), 984-1001. https://doi.org/10.1177/0013164498058006008

Syropoulos, S., & Markowitz, E. M. (2021). Perceived responsibility towards future generations and environmental concern: Convergent evidence across multiple outcomes in a large, nationally representative sample. *Journal of Environmental Psychology*, *76*, 101651. https://doi.org/10.1016/j.jenvp.2021.101651

Taylor, L. K., & Glen, C. (2020). From empathy to action: Can enhancing host-society children's empathy promote positive attitudes and prosocial behaviour toward

refugees? *Journal of Community & Applied Social Psychology*, *30*(2), 214-226. https://doi.org/10.1002/casp.2438

Turner, J. C. (1975). Social Comparison and Social Identity: Some Prospects for Intergroup Behaviour. *European Journal of Social Psychology*, *5*(1), 1-34. https://doi.org/10.1002/ejsp.2420050102

Wade-Benzoni, K. A. (1999). Thinking about the future: An intergenerational perspective on the conflict and compatibility between economic and environmental interests. *American Behavioral Scientist*, *42*(8), 1393-1405. https://doi.org/10.1177/00027649921954912

Wade-Benzoni, K. A. (2019). Legacy motivations & the psychology of intergenerational decisions. *Current Opinion in Psychology*, *26*, 19-22. https://doi.org/10.1016/j.copsyc.2018.03.013

Wade-Benzoni, K. A., Hernandez, M., Medvec, V., & Messick, D. (2008). In fairness to future generations: The role of egocentrism, uncertainty, power, and stewardship in judgments of intergenerational allocations. *Journal of Experimental Social Psychology*, *44*(2), 233-245. https://doi.org/10.1016/j.jesp.2007.04.004

Wade-Benzoni, K. A., & Plunkett Tost, L. (2009). The egoism and altruism of intergenerational behavior. *Personality and Social Psychology Review*, *13*(3), 165-193. https://doi.org/10.1177/1088868309339317

Wade-Benzoni, K. A., Sondak, H., & Galinsky, A. D. (2010). Leaving a legacy: Intergenerational allocations of benefits and burdens. *Business Ethics Quarterly*, *20*(1), 7-34. https://doi.org/10.5840/beq20102013

Wade-Benzoni, K. A. (2008). Maple trees and weeping willows: The role of time, uncertainty, and affinity in intergenerational decisions. *Negotiation and Conflict Management Research*, *1*(3), 220-245. https://doi.org/10.1111/j.1750-4716.2008.00014.x

Wallis, H., Sieverding, T., Schmidt, K., & Matthies, E. (2022). # Fighteverycrisis: A psychological perspective on motivators of the support of mitigation measures in the climate crisis and the COVID-19 pandemic. *Journal of Environmental Psychology*, 101898. https://doi.org/10.1016/j.jenvp.2022.101898

Williams, R. M. (1947). The reduction of intergroup tensions: a survey of research on problems of ethnic, racial, and religious group relations. *Social Science Research Council Bulletin*, *57*, 153.

Zaval, L., Markowitz, E. M., & Weber, E. U. (2015). How will I be remembered? Conserving the environment for the sake of one's legacy. *Psychological Science*, *26*(2), 231-236. https://doi.org/10.1177/0956797614561266

Appendix

Appendix B.A

Table B.A1

Measures

Quality of Intergenerational Contact	
To what extent do you experience the contact with young people as. . .	
… equal?	1 = not at all 7 = very
… voluntary?	
… intimate?	
… pleasant?	
… cooperative?	
Quantity of Intergenerational Contact	
The following questions relate to your contact with young people.	
How much contact do you have with young people …	
… at work?	1 = none at all 7 = a great deal + not applicable
… as neighbors?	
… as close friends?	
… as family members?	
… at leisure activities?	
… in your daily life?	
… in general?	
How often do you interact with young people?	1 = never, 2 = less than once a year, 3 = yearly, 4 = a few times a year, 5 = monthly, 6 = weekly, 7 = daily
Affinity toward young people	
The following questions relate to your attitude toward and relationship with young people.	
Empathic Concern	
Please describe how strongly you feel each emotion described toward young people.	
Sympathetic	1 = not at all 7 = a great deal
Moved	
Compassionate	
Tender	
Warm	
Soft-hearted	
Perspective Taking	
Please indicate the extent to which you agree with the following statements.	
It is easy for me to put myself in the shoes of young people.	1 = strongly disagree 7 = strongly agree
I can imagine how I would think or feel if I were young again.	
I can imagine the feelings and thoughts of young people.	
Perceived Oneness	
From the seven graphs, please select the one that best describes your relationship with young people.	

Venn-Diagram 7 pairs of increasingly overlapping circles	1 to 7
Please indicate the extent to which you would use the term ‘we’ to describe yourself and young people.	1 = not at all 7 = extremely
Affinity toward young people	
The following questions relate to your attitude toward and relationship with young people.	
Empathic Concern	
Please describe how strongly you feel each emotion described toward young people.	
Sympathetic	1 = not at all 7 = a great deal
Moved	
Compassionate	
Tender	
Warm	
Soft-hearted	
Perspective Taking	
Please indicate the extent to which you agree with the following statements.	
It is easy for me to put myself in the shoes of young people.	1 = strongly disagree 7 = strongly agree
I can imagine how I would think or feel if I were young again.	
I can imagine the feelings and thoughts of young people.	
Perceived Oneness	
From the seven graphs, please select the one that best describes your relationship with young people.	
Venn-Diagramm 7 pairs of more or less overlapping circles	1 to 7
Please indicate the extent to which you would use the term ‘we’ to describe yourself and young people.	1 = not at all 7 = extremely
Legacy Motivation	
Please indicate to what extent the following statements apply to you.	
It is important to me to leave a positive legacy for young generations.	1 = not at all 7 = a great deal
It is important to me to avoid leaving a negative legacy for young generations.	
It is important for me to leave a positive mark on society.	
It is important to me to leave a good legacy for those who come after us.	
Social Desirability	
Please indicate to what extent the following statements apply to you.	
Even if I am feeling stressed, I am always friendly and polite to others.	1 = doesn’t apply at all 5 = applies completely
In an argument, I always remain objective and stick to the facts.	
When talking to someone, I always listen carefully to what the other person says.	
Social-Altruistic Value Orientation	
Please indicate the extent to which you consider the following values to be guiding principles of your life.	
Social justice, correcting injustice, care for the weak	9-point scale labeled 7 (of supreme importance), 6 (very important), 5,4
Equality, equal opportunity for all	

A world of peace, free of war and conflict	(unlabeled), 3 (important), 2,1 (unlabeled), 0 (not important), -1 (opposed to my values)
Intergenerational Political Solidarity	
Please indicate the extent to which you agree with the statements below.	
Young people should obtain more power in the decision-centers of our society.	1 = strongly disagree 7 = strongly agree
The State budget should be distributed equally so that the resources that are allocated to young people are proportional to those that are allocated to older people.	
The future impact of today's policies on young people should be taken more into consideration than it is currently the case.	
I support policies aimed at ensuring a good future for young people.	
I would be willing to pay higher taxes in order to ensure a good future for young people.	
I would be willing to accept cuts in my standard of living to ensure a good future for young people.	
I would be willing to pay higher prices in order to ensure a good future for young people.	
Policies negatively affecting young people should be revised.	
It is important to challenge the power structures that disadvantage young people.	

Appendix B.B

Table B.B1

Distribution of Highest Education Levels in the US-Sample

	N	%
Less than high school completion	17	4.3%
High school completion	98	24.6%
Some college	96	24.1%
Associate's degree	52	13.0%
Bachelor's degree	100	25.1%
Master's degree	29	7.3%
Doctor's degree	4	1.0%
Other	3	0.8%

Table B.B2

Distribution of Highest Education Levels in the German Sample

	N	%
Kein beruflicher Bildungsabschluss	32	8.0%
Lehre/ Berufsausbildung im dualen System	218	54.4%
Fachschulabschluss	49	12.2%
Fachschulabschluss in der ehemaligen DDR	13	3.2%
Bachelor	9	2.2%
Master	10	2.5%
Diplom	58	14.5%
Promotion	3	0.7%
Sonstiges	9	2.2%

Table B.B3

Distribution of Highest Education Levels in the Brazilian Sample

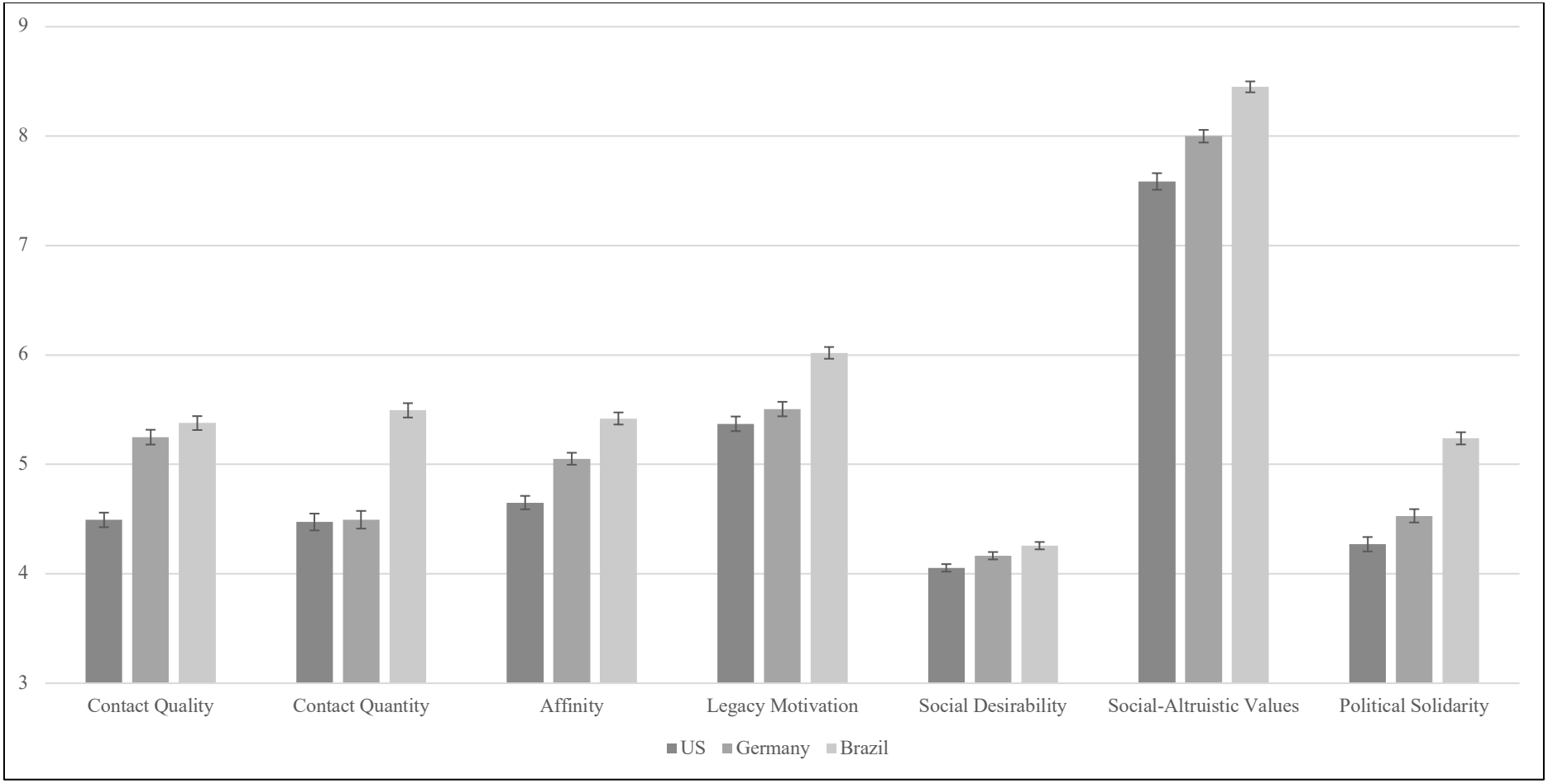
	N	%
Ensino fundamental	38	9.4%
Diploma de Ensino Médio	65	16.1%
Diploma de Educação Profissional de Ensino Médio	27	6.7%
Diploma de Educação Profissional de Ensino Médio – Subsequente	42	10.4%
Licenciatura	24	6.0%
Bacharelado	121	30.0%
Tecnólogo	6	1.5%
Especialista	30	7.4%
Mestrado	23	5.7%
Mestrado profissional	5	1.2%
Diploma de Doutorado	6	1.5%

Outros	16	4.0%

Appendix B.C

Figure B.C1

Means of the Central Variables for the Three Countries



Note. Error bars represent standard errors of means.

Table B.C1

Bivariate Correlations the US

		Age	Gender	Contact Quality	Contact Quantity	Affinity	Legacy Motivation	Social Desirability	Social-Altruistic Values	Political Solidarity
Gender	r_s	-.25***	--							
Contact Quality	r_s	-0.7	.16**	--						
Contact Quantity	r_s	.18*	.19*	.71***	--					
Affinity	r_s	-.15**	.20***	.70***	.63***	--				
Legacy Motivation	r_s	-.15**	.22***	.49***	.42***	.65***	--			
Social Desirability	r_s	.03	-.001	.28***	.24***	.30***	.34***	--		
Social-Altruistic Values	r_s	-.07	.20***	.34***	.22**	.47***	.52***	.28***	--	
Political Solidarity	r_s	-.08	.15**	.45***	.36***	.62***	.54***	.12*	.53***	--

Note. Spearman's Rho was used to assess the correlations. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table B.C2

Bivariate Correlations of Central Variables in Germany

		Age	Gender	Contact Quality	Contact Quantity	Affinity	Legacy Motivation	Social Desirability	Social-Altruistic Values	Political Solidarity
Gender	r_s	.004	--							
Contact Quality	r_s	-0.4	.15**	--						
Contact Quantity	r_s	-.07	.05	.54***	--					
Affinity	r_s	.05	.11*	.76***	.61***	--				
Legacy Motivation	r_s	-.11*	.13**	.57***	.39***	.75***	--			
Social Desirability	r_s	.06	.08	.30***	.24***	.33***	.36***	--		
Social-Altruistic Values	r_s	.10	.10*	.39***	.25**	.46***	.51***	.34***	--	
Political Solidarity	r_s	0	.01	.47***	.33***	.60***	.60***	.16**	.36***	--

Note. Spearman's Rho was used to assess the correlations. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table B.C3

Bivariate Correlations of Central Variables in Brazil

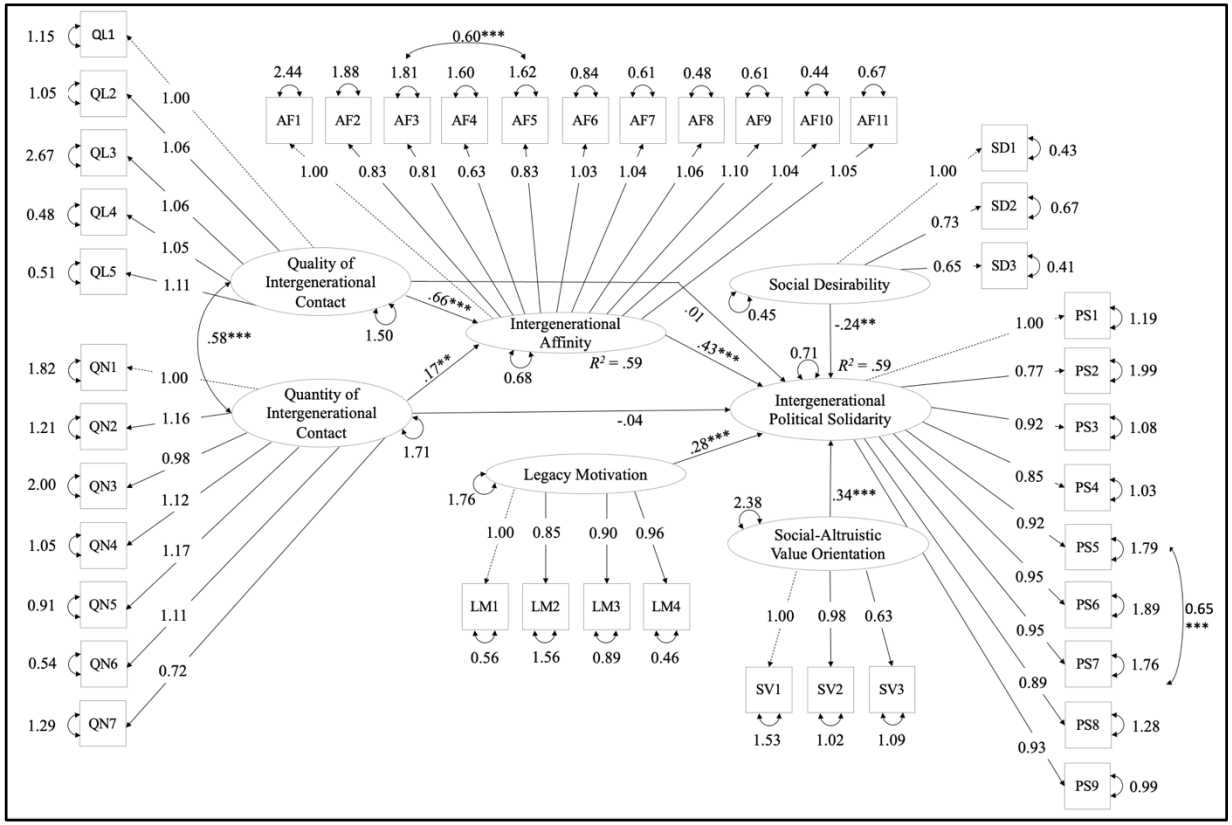
		Age	Gender	Contact Quality	Contact Quantity	Affinity	Legacy Motivation	Social Desirability	Social-Altruistic Values	Political Solidarity
Gender	r_s	-.07	--							
Contact Quality	r_s	-0.09	.10*	--						
Contact Quantity	r_s	.25***	.09	.71***	--					
Affinity	r_s	-.06	.12*	.64***	.58***	--				
Legacy Motivation	r_s	.04	.12*	.33***	.28***	.47***	--			
Social Desirability	r_s	.06	.05	.42***	.39***	.47***	.32***	--		
Social-Altruistic Values	r_s	.01	.10	.28***	.20***	.38***	.28***	.30***	--	
Political Solidarity	r_s	-.03	.05	.51***	.46***	.61***	.39***	.30***	.26***	--

Note. Spearman's Rho was used to assess the correlations. * $p < .05$. ** $p < .01$. *** $p < .001$.

Appendix B.D

Figure B.D1

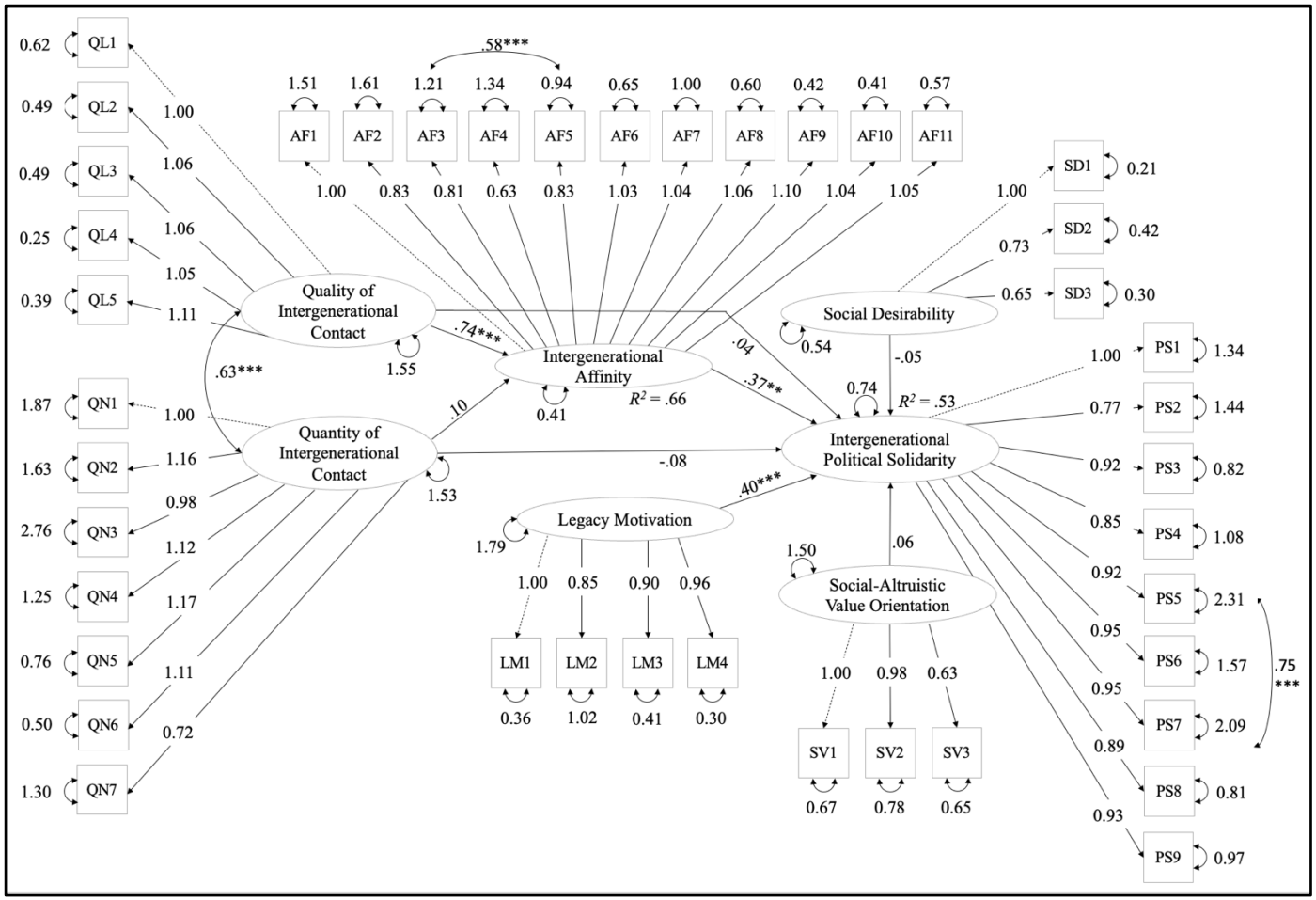
Measurement Model and Structural Model Predicting Intergenerational Political Solidarity in the US



Note. $N = 399$. Squares represent indicators, ellipses represent latent variables. Displayed are factor loadings, variances, error covariances, standardized regression coefficients and bivariate correlations. * $p < .05$. ** $p < .01$. *** $p < .001$.

Figure B.D2

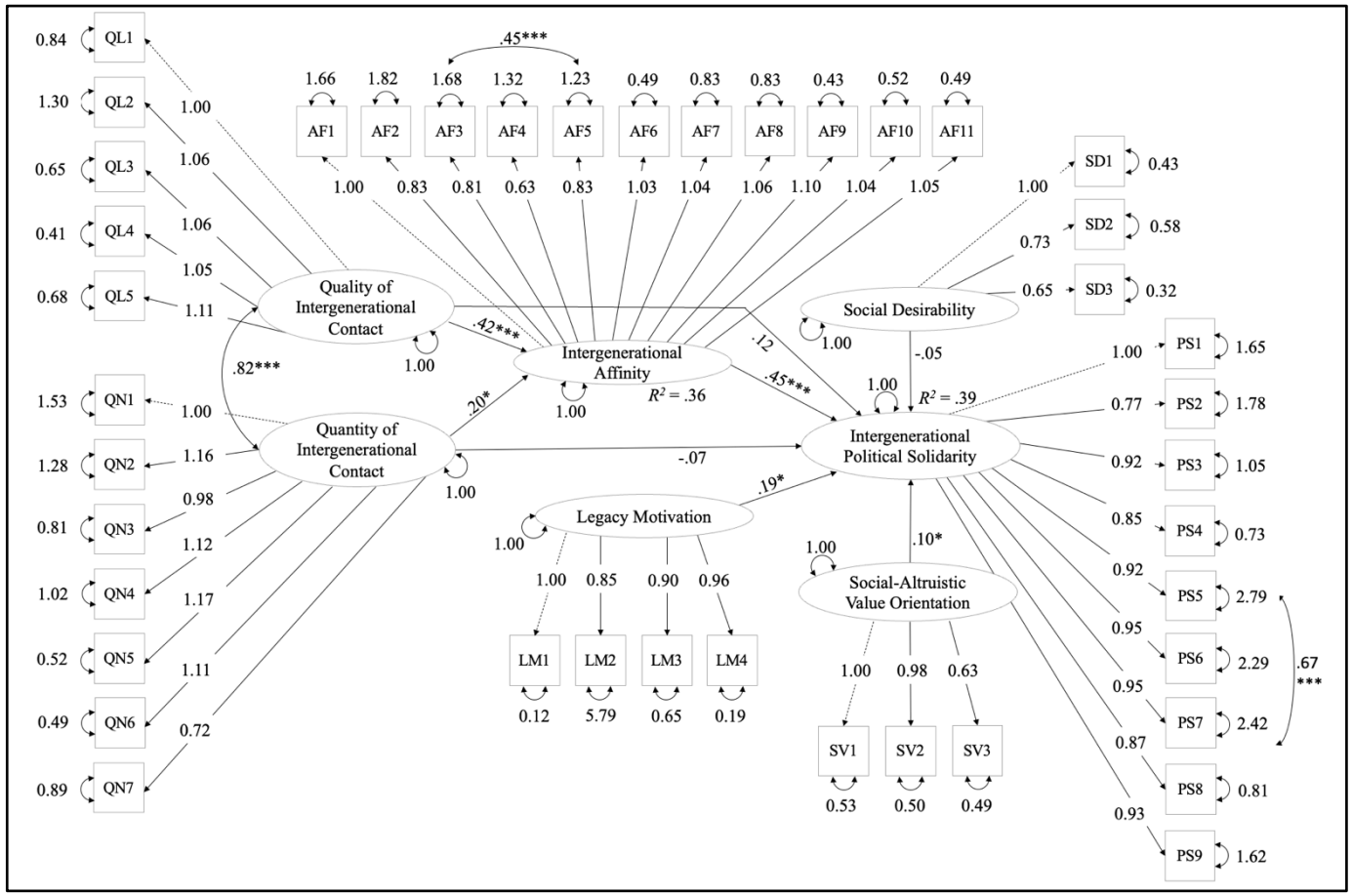
Measurement Model and Structural Model Predicting Intergenerational Political Solidarity in Germany



Note. $N = 401$. Squares represent indicators, ellipses represent latent variables. Displayed are factor loadings, variances, error covariances, standardized regression coefficients and bivariate correlations. * $p < .05$. ** $p < .01$. *** $p < .001$.

Figure B.D3

Measurement Model and Structural Model Predicting Intergenerational Political Solidarity in Brazil



Note. $N = 403$. Squares represent indicators, ellipses represent latent variables. Displayed are factor loadings, variances, error covariances, standardized regression coefficients and bivariate correlations. * $p < .05$. ** $p < .01$. *** $p < .001$.

Additional Information on Publication B

Journal Scope

Group Processes & Intergroup Relations (GPIR) is a scientific social psychology journal dedicated to research on social psychological processes within and between groups. It provides a forum for and is aimed at researchers and students in social psychology and related disciples (e.g., organizational and management sciences, political science, sociology, language and communication, cross cultural psychology, international relations) that have a scientific interest in the social psychology of human groups. The journal has an extensive editorial team that includes many of the leading scholars in social psychology of group processes and intergroup relations from around the world.
(https://journals.sagepub.com/overview-metric/GPI)

Personal Contribution

Conceptualization: 90%; Methods: 90%; Formal analyses: 90%; Investigation: 100%; Data curation: 100%; Writing - 1st draft: 90%; Writing - review and editing: 85%; Visualization: 95%

Publication C: Act Like There Is a Tomorrow—Contact and Affinity with Younger People and Legacy Motivation as Predictors of Climate Protection among Older People

de Paula Sieverding, T., Kulcar, V. & Schmidt, K. (2024). Act like There Is a Tomorrow — Contact and Affinity with Younger People and Legacy Motivation as Predictors of Climate Protection among Older People. *Sustainability, 16*(4), 1477. https://doi.org/10.3390/su16041477

Abstract

The climate crisis poses a major threat for sustainability, with the young and future generations likely to be among the most affected groups in the climate crisis. Older generations will be less affected but have a greater impact both in terms of contribution and mitigation. We investigated potential intergenerational drivers of older Germans' climate protection intentions and behavior in two pre-registered studies (N_1 = 411, 55- to 75-year olds; N_2 = 309, 55- to 86-year olds). On a correlational level, both studies revealed that contact between generations (particularly high-quality contact) indirectly explained the participants' climate protection intentions/behavior. This effect was mediated by affinity with younger people (Study 1) and its subfacets of perspective taking and empathic concern (but not the subfacet of perceived oneness; Study 2). Study 1 further provided evidence that legacy motivation, i.e., the desire to leave behind a positive legacy, was positively related to participants' climate protection intentions and behavior. Study 2's attempt at testing the causal role of the subfacets of affinity was not successful, as the experimental manipulation of perspective taking toward younger people failed. However, the two studies provide correlational evidence that the closer older people feel to younger people and the future consequences of their behaviors, the more willing they are to protect the climate.

Keywords: sustainability; climate crisis; intergenerational prosociality; intergenerational contact; intergenerational affinity; legacy motivation

1. Introduction

In the Brundtland Report, sustainability is defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987, p. 16), p. 16. One of the greatest threats to sustainability is the climate crisis. The present generations are compromising the ability of future generations to meet their needs by emitting greenhouse gases to meet their own needs and by failing to take effective climate action. As the impacts of the climate crisis are prognosed to intensify over time, todays' young and future generations are more likely to experience climate crisis-related consequences, such as extreme weather events, water scarcity, and hunger, than today's older generations (IPCC, 2023a). Yet, among the current generations, it is the older people that have the highest per capita carbon emissions; the per capita carbon emissions increase with age, with a slight decrease once people reach their sixties (per capita carbon emission increase with age, with a slight decrease once people reach their sixties; Zagheni, 2011), and thus, the older people contribute most to emissions.

Older generations therefore bear a greater responsibility, but also have a greater potential to help mitigate the climate crisis, as changing their own behavior can have a large impact. Furthermore, people belonging to these older generations have the power to change things on a larger scale, as they hold most of the decisive positions in society, the economy, and politics, and, at least in the Global North, are more numerically represented and thus dominant in elections, e.g., (see, e.g., Ritchie & Roser, 2019; Stockemer & Sundström, 2023). With global greenhouse gas emissions continuing to increase (IPCC, 2023b) and given the climate impact and mitigation power of older generations, the present study investigated the motivators of older people's urgently needed climate protection behaviors.

There are several barriers for older people to protect the climate. According to the Overlapping Generations Model of Growth and the Environment which considers the long-term consequences of economic decisions, short-lived individuals face a trade-off between allocating their resources in capital and consumption, resulting in a degradation of the environment bequeathed to future generations, or investing in boosting the quality of the environmental, thereby improving the environment bequeathed to future generations (John & R., 1994).

Investing in improving the quality of the environment by protecting the climate is often associated with higher costs (e.g., insulating one's home) or even sacrifices (e.g., refraining from flying). As older people will be, on average, less affected by the climate crisis, it would not be themselves, but others, who will benefit most from their climate protection endeavors. This creates a so-called social distance between themselves and the people benefitting from

their behaviors (Hurlstone et al., 2020; Zaval et al., 2015). In addition, the benefits of possible climate protection efforts will only unfold in the future, resulting in an additional temporal distance component. The personal benefits of the climate protection behaviors are therefore discounted twice, since they will benefit others in the future. This process is called intergenerational discounting (Hurlstone et al., 2020; Wade-Benzoni & Plunkett Tost, 2009). Climate protection behaviors therefore represent a special case of prosocial behavior, as they benefit others (e.g., young and future generations) and may be associated with personal costs or sacrifices (De Groot & Steg, 2009; Oswald, 1996). In the present study, climate protection by older people is hence regarded as a prosocial behavior toward young and future generations, i.e., as intergenerational prosocial behavior.

2. Theory

The research has identified several ways in which prosocial behaviors between different groups, e.g., (e.g., Galinsky & Moskowitz, 2000; Johnston & Glasford, 2018), and generations, e.g., (e.g., Wade-Benzoni & Plunkett Tost, 2009; Wade-Benzoni, 2008), can be promoted. Intergroup contact is considered a powerful tool for overcoming social distances, improving intergroup attitudes and behaviors, and in turn promoting prosocial behaviors between groups (Pettigrew & Tropp, 2006b). Several variables act as mediators for the effect of intergroup contact, e.g., perspective taking, empathy (Pettigrew & Tropp, 2008), and perceived oneness (Cadieux, 2018).

One variable that has been shown to reduce the perceived temporal distance between individuals and the consequences of their behaviors, thereby promoting intergenerational beneficence, is legacy motivation, defined as the desire to leave behind a positive legacy (Zaval et al., 2015).

2.1 Contact

Since Allport's (1954) and Williams' (1947) contact hypothesis, contact between groups has been considered a key mechanism for improving intergroup attitudes and behaviors (see (see Pettigrew & Tropp, 2006b for a meta-analsis), for a meta-analysis). According to the contact hypothesis, contact between groups can, under optimal conditions (e.g., equal status between the groups), reduce prejudice and thereby improve intergroup attitudes (Allport, 1954). Most studies agree that it is the quality rather than the quantity of contacts that matters (Islam & Hewstone, 1993; Johnston & Glasford, 2018). Yet, some studies found a positive, albeit smaller, effect for the quantity of the contact (Brown et al., 2007). Pettigrew and Tropp (2006b)

conducted a meta-analysis on the effect of intergroup contact on intergroup prejudice, combining 515 studies from a variety of societies, social groups, and situations. They found that intergroup contact between groups reduces intergroup prejudice with an average effect size of $r = -0.22$.

Intergroup contact not only reduces intergroup prejudice and improves intergroup attitudes, but it has also the potential to improve intergroup behaviors. In two studies, Johnston and Glasford (2018) demonstrated that high-quality contact with one member of an outgroup can increase the intention to help the entire outgroup. Accordingly, Koschate et al. (2012) found that contact promotes prosocial behavior toward both the individual and the outgroup as a whole. There are numerous studies on the different effects that intergroup contact has among minority and majority groups. A large-scale study by Hässler et al. (2020) including almost 70 countries indicated that intergroup contact increases the willingness of both minorities and majorities to work in solidarity.

While the contact hypothesis was originally developed for and applied to interracial relations, it has also been successfully applied in the intergenerational context. Here, most studies have focused primarily on how intergenerational contact can reduce prejudice toward older people (Bousfield & Hutchison, 2010; Cadieux, 2018; Hale, 1998).

Older people were one of the target groups examined in Pettigrew and Tropp's meta-analysis (2006b). The results revealed that contact with older people reduced participants' prejudice toward them with an average effect size of $r = -0.18$. Furthermore, studies have found that intergenerational contact, e.g., in the form of digital gameplay or school-based pen-pal-letter programs (Zhang et al., 2017), improves children's perceptions of and attitudes toward older people. Consistent with previous research (Johnston & Glasford, 2018), it was specifically the quality of the intergenerational contact that had a positive effect on attitudes (Cadieux, 2018) and behavioral intentions toward older people, e.g., to help and support them (Bousfield & Hutchison, 2010).

2.2 Affinity

Several studies have examined the ways in which intergroup contact reduces prejudice and improves intergroup attitudes and behaviors (see (see Pettigrew & Tropp, 2008 for a meta-analysis) for a meta-analysis). Some mediators can be grouped together based on their focus on bringing different groups closer together, e.g., perspective taking, empathy (Pettigrew & Tropp, 2008), and perceived oneness (Cadieux, 2018).

Perspective taking refers to imagining and understanding the thoughts and feelings of a person in need and represents the cognitive aspect of empathy (Batson et al., 2015; Davis, 1983). There are numerous definitions for empathy. In this paper, we focus on empathic concern, which is defined as feeling for another person who is in need, and represents "an other-oriented emotional response elicited by and congruent with the perceived welfare of a person in need" (Batson et al., 2015, p. 2), p. 2. The Empathy–Altruism Model (see (see Batson et al., 2015 for an overview) for an overview) states that taking the perspective of a member of another social group increases empathic concern for that individual and their entire group, which in turn is thought to improve intergroup attitudes and increase intergroup prosocial behaviors. Accordingly, perspective taking was shown to increase empathic concern for the person whose perspective was taken, (e.g., a young woman in need; Batson et al., 1997d), and their social group, e.g., North-African immigrants (Pagotto, 2010), drug addicts (Batson et al., 2002), and people with AIDS (Batson et al., 1997b), and thereby improve attitudes and prosocial behavior toward them.

Furthermore, both intergroup contact and perspective taking are assumed to increase the perception of oneness with the other person and their group. The variable of perceived oneness stems from the social identity theory, which states that individuals categorize others based on physical similarity, proximity, or shared fate (Turner, 1975). Whether others are perceived as members of one's own group (ingroup) or not (outgroup) has a significant influence on the person's attitude and behavior toward other individuals. People that are perceived as ingroup members are met with more positive affect (Otten & Moskowitz, 2000) and receive more helpful behaviors (Levine et al., 2005) than outgroup members.

Accordingly, the results from three experiments indicate that taking the perspective of a target person (e.g., an African American or an elderly person) improves both attitudes and behaviors toward that person by increasing the perceived overlap between one's self and the target person (Galinsky & Moskowitz, 2000). Jang (2022) found that induced perspective taking toward a single victim leads to a greater self–other overlap with similarly situated multiple beneficiaries, which in turn results in greater donations for them. In the intergenerational context, Cadieux (2018) found that positive contact with an older adult explained younger adults' attitudes toward older adults in general, which was mediated by the cognitive self–other overlap.

While most of the existing and presented research studies perceive the variables of perspective taking, empathic concern, and perceived oneness as related yet distinct concepts,

Wade-Benzoni (2008) combined the three variables into the concept of affinity. She defines affinity as the extent to which an individual feels empathetic toward and connected with others. Affinity is said to make the outcomes that occur to others feel more immediate and personal by blurring the distinction between one's own interests and those of others, thereby promoting intergroup prosociality (Wade-Benzoni, 1999, 2003; Wade-Benzoni, 2008).

The role of affinity has mostly been tested in the intergenerational context. In an experimental study, Wade-Benzoni (2008) demonstrated that participants who expressed a higher affinity for future generations allocated more resources to them in an intergenerational resource dilemma experiment, and thus showed more intergenerational beneficence. Accordingly, in a cross-national study, de Paula Sieverding et al. (2023) identified intergenerational affinity, consisting of the subfacets of perspective taking toward, empathic concern for, and perceived oneness with younger people, as an important predictor of older adults' political solidarity with younger people.

2.3 Legacy Motivation

In addition to a social distance component, intergenerational issues such as the climate crisis also entail a temporal distance component. In order to overcome this temporal distance, it is crucial to make long-term perspectives and motives salient. One way to achieve this is to appeal to and emphasize people's legacy motivation. Legacy motivation refers to the desire to extend oneself into the future by leaving a positive legacy (Zaval et al., 2015). This desire becomes increasingly important with age (Wickersham et al., 2020). It is hypothesized that reflecting on one's own legacy and thus considering the future impact of one's actions on other people in the future leads to a greater favoring of the well-being of these other people, thereby reducing intergenerational discounting.

Various empirical studies have supported these theoretical assumptions. Domain-general legacy motives have been shown to be related to pro-environmental behaviors (Zaval et al., 2015), and tend to be higher among older adults (Wickersham et al., 2020). Emphasizing individuals' legacy motivation has been shown to promote prosocial choices directed at future others (Bang et al., 2017; Wade-Benzoni et al., 2012) and pro-environmental and climate-protection behaviors (Hurlstone et al., 2020; Wickersham et al., 2020; Zaval et al., 2015). Legacy motivation, or the closely related construct of generativity, has also been shown to act as a mediator between intergenerational contact and the improvement of intergenerational attitudes (Schmitt et al., 2011).

3. Present Studies

Given the urgent need to protect the climate and the crucial role of older generations in achieving this goal, we conducted two studies to examine potential motivators of climate protection intentions and behaviors among older people. In the present research, we understand old*er* people as people aged 55 years and over, and young*er* people as people aged 25 and under. This relative categorization is based on the Cambridge Dictionary's definition of a generation as "all the people of about the same age within a society or within a particular family […] a period of about 25 to 30 years".

Based on the theoretical and empirical background presented, we focused primarily on variables that have the potential to decrease the social and temporal distance between older people and the recipients (younger people) and the consequences of their behavior. In the first study, we examined the relationships between the quality and quantity of intergenerational contact, the higher-order construct of affinity with younger people (hereafter called intergenerational affinity), legacy motivation, and climate protection intentions and behaviors. In the second study, we took a closer look at the subfacets of intergenerational affinity and their role in climate protection intentions and furthermore, experimentally manipulated perspective taking toward younger people.

Study 1

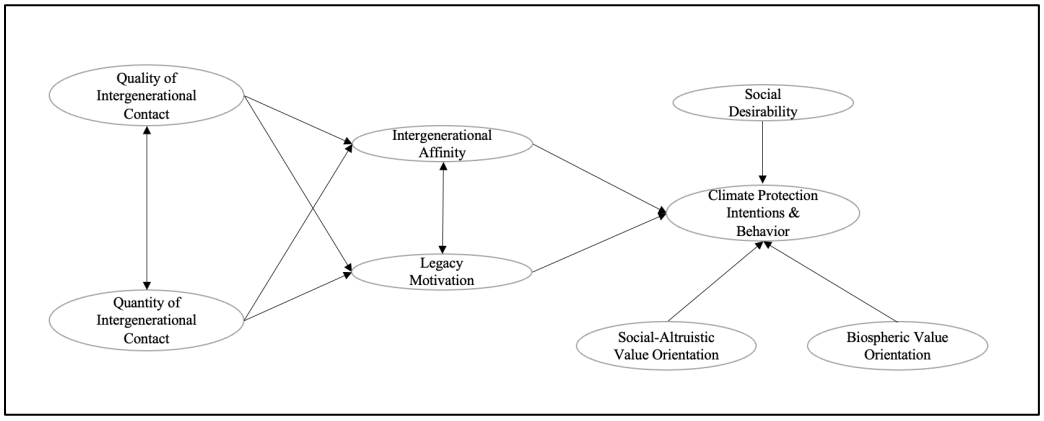
Hypotheses

In line with previous research, we expected the quality and quantity of contact with younger people to predict participants' intergenerational affinity (quality: Hypothesis H1.1; quantity: Hypothesis H1.2) and legacy motivation (quality: Hypothesis H1.3; quantity: Hypothesis H1.4). We further hypothesized that participants' climate protection intentions and behavior would be directly explained by their intergenerational affinity (Hypothesis H1.5) and legacy motivation (H1.6). As a consequence, we expected the criterion to be indirectly explained by the quality and quantity of intergenerational contact, mediated by intergenerational affinity (quality: Hypothesis H1.7; quantity: Hypothesis H1.8) and legacy motivation (quality: Hypothesis H1.9; quantity: Hypothesis H1.10).

We expected the quality and quantity of intergenerational contact as well as intergenerational affinity and legacy motivation to be positively related. We controlled for participants' social desirability and their social-altruistic and biospheric value orientations (Stern et al., 1999; Vesely & Klöckner, 2020). See Figure C.1 for the postulated model.

Figure C.1

Postulated Model Predicting Climate Protection Intentions and Behaviors in Study 1



4. Methods

The study was pre-registered (Pre-registration refers to publishing a research protocol (planned hypotheses, methods, analyses) prior to conducting the study in a public repository.) (see https://aspredicted.org/2GR_DQ1 (accessed on 4 January 2024)) and designed and conducted in accordance with the APA guidelines for the ethical conduct of research. According to German law, survey studies do not require ethical approval if anonymity is guaranteed and no sensitive content is assessed. Informed consent was obtained from all participants.

4.1 Data Collection and Participants

Data were collected online from 16 to 21 June 2023 through the online access panel provider Bilendi using the platform SoSciSurvey. Participants were financially compensated for their participation.

Of the 426 participants who passed the screening question ("This is a test question. Please tick 1: 'strongly disagree'"), 2 were excluded based on answer time (they finished the survey in less than three minutes when it took the other participants, on average, about eight minutes) and 11 based on missing values (at least 30% of the questions had missing values), resulting in a final sample size of $N = 411$. No participants were excluded based on mechanical answer tendencies. The answer time ranged from 3.20 to 19.53 min ($M = 7.89$, $SD = 2.90$). This sample was representative of the German population aged 55 years and older regarding age distribution, gender, and education (Statistisches Bundesamt, 2020). A total of 187 of the participants identified with the male gender, 223 with the female gender, and 1 person identified as diverse. The ages ranged from 55 to 75 years ($M = 65.07$, $SD = 5.66$).

4.2 Measures

All measures can be found in Appendix C.A. Participants were always given the option "don't know/not applicable" (which was then coded as a missing value), except for the sociodemographic questions assessing age, gender, and highest level of education. For the descriptive and bivariate correlational analyses, an average score was calculated for each participant for each variable. To test the postulated model, the variables were computed within the Measurement Model.

Prior to the questions related to young people, participants were given the information that in the present study, young people were understood as people up to the age of 25.

The quantity of intergenerational contact was assessed with one item ("How much contact do you have with young people (e.g., in the neighborhood, among friends and relatives, during leisure activities)?") that was answered on a 5-point Likert rating scale (1 = *none* to 5 = *a lot)*.

The quality of intergenerational contact was assessed with six items adapted from Islam and Hewstone (1993) and Lolliot et al. (2015). Participants were asked to what extent they usually experienced contact with young people in certain ways. Answers were assessed using a five-point Likert rating scale (1 = *not* at all to 5 = *very*).

Intergenerational affinity was assessed with ten items in line with de Paula Sieverding et al. (2023) through its three subfacets of empathic concern, perspective taking, and perceived oneness.

Empathic concern was assessed with six items from Batson (1987). Participants were asked to describe how strongly they felt six emotions toward young people (e.g., sympathetic, compassionate). Answers were assessed on a five-point Likert rating scale (1 = *not at all*, 5 = *a great deal*).

Perspective taking was assessed with three items (e.g., "It is easy for me to put myself in the shoes of young people.") adapted from Batson and Ahmad (2009) on a five-point Likert rating scale (1 = *strongly disagree* to 5 = *strongly agree*).

To assess perceived oneness, participants were asked to indicate the extent to which they would use the term "we" to describe themselves and young people (Cialdini et al., 1997). The answer was assessed on a five-point Likert rating scale (1 = *not at all* to 5 = e*xtremely*). Participants were also presented with the Inclusion of Others in Self Scale drawn from Aron et al. (1992) depicting seven Venn diagrams. The graphs showed two increasingly overlapping circles labeled as "Myself" and "Young people" and participants were asked to select the graph

that best described their relationship with young people. This item was then converted from a seven- to a five-point Likert scale to match the first perceived oneness item.

Legacy motivation was assessed with four items (e.g., "It is important to me to leave behind a good legacy for those who come after us") following Wade-Benzoni et al. (2010) and Zaval et al. (2015). The answers were assessed on a five-point Likert rating scale (1 = *none at all* to 5 = *a great deal*).

The climate protection intentions and behavior measure covered private-sphere, political, as well as activist behaviors and was assessed on a scale with 20 items partly drawn from Matthies et al. (2023). Participants were asked whether they intended to perform certain climate protection behaviors in the near future (e.g., to refrain from flying or to donate to an environmental charity) and whether they had already performed them. The answers were assessed on a five-point Likert response scale (1 = *no, definitely not* to 4 = *yes, definitely* and 5 = *I have already done this/I am already doing this*).

Social desirability was assessed with six items adapted from Kemper et al. (2012). Participants were asked to indicate the extent to which the statements applied to them (e.g., "In an argument, I always remain objective and stick to the facts."). The answers were assessed on a five-point Likert rating scale (1 = *doesn't apply* at all to 5 = *applies completely*).

Social-altruistic value orientation and biospheric value orientation were assessed with three items each taken from Stern et al.'s (1998) Brief Inventory of Values. Participants were asked to which extent they considered the values (e.g., "social justice, correcting injustice, care for the weak", "Environmental protection and nature conservation") as guiding principles in their lives. Answers were assessed on a nine-point Likert rating scale (−1 = *opposed to my values* over 0 = *not important* to 7 = of *supreme importance*).

4.3 Planned Statistical Analyses

As the first step, we computed and inspected the descriptive statistics and bivariate correlations of the central variables. We then computed a Structural Equation Model (SEM) to test the postulated model. Since the criterion (climate protection intentions and behavior) was not normally distributed, MLR (maximum likelihood with robust standard errors, with Huber–White correction of standard errors and a Yuan–Bentler equivalent test statistic) was used as a robust estimator. Given the use of a robust estimator, no bootstrapping technique was used. Missing values were excluded on a case-wise basis.

5. Results

5.1 Descriptive Statistics

The scale ranges, means, standard deviations, and scale reliabilities of the central variables can be found in Table C.1.

Table C.1

Scale Ranges, Means, Standard Deviations, and Scale Reliabilities of the Central Variables

	Scale Range	***M***	***SD***	**ω**
Contact Quantity	1 to 5	3.41	1.10	/
Contact Quality	1 to 5	3.59	0.82	0.89
Affinity	1 to 5	3.44	0.87	0.93
Legacy Motivation	1 to 5	3.63	1.11	0.93
Social Desirability	1 to 5	4.04	0.62	0.65
Social-Altruistic Values	−1 to 7	5.73	1.31	0.81
Biospheric Values	−1 to 7	5.23	1.64	0.88
Climate Protection	1 to 5	2.65	0.72	0.97

Note. McDonald's Omega was used to assess the scale reliabilities.

The bivariate correlations can be found in Table C.2. The criterion, climate protection intentions and behavior, showed significant positive correlations with all potential predictor and control variables. Age was positively related to the quality of intergenerational contact and social desirability. The relationship between gender and the studied variables was consistent with previous research, with women reporting higher scores for social desirability, social-altruistic and biospheric values, and climate protection. Women also reported higher scores for the quality of intergenerational contact, intergenerational affinity, and legacy motivation. Education was not related to any of the variables in the studied sample.

Table C.2

Bivariate Correlations of Sociodemographic Variables and the Central Variables

	Age	**Gender**	**Education**	**Contact Quality**	**Contact Quantity**	**Affinity**	**Legacy Motivation**	**Social Desirability**	**Social-Altruistic Values**	**Biospheric Values**
Age	-									
Gender	0.02	-								
Education	0.08	−0.10 *	-							
Contact Quality	0.13 *	0.16 **	0.00	-						
Contact Quantity	−0.05	0.06	0.05	0.61 **	-					
Affinity	0.02	0.18 **	−0.06	0.65 **	0.53 **	-				
Legacy Motivation	0.05	0.16 **	0.04	0.38 **	0.32 **	0.54 **	-			
Social Desirability	0.12 *	0.10 *	−0.09	0.32 **	0.17 **	0.35 **	0.28 **	-		
Social-Altruistic Values	0.02	0.10 *	−0.08	0.37 **	0.23 **	0.41 **	0.41 **	0.34 **	-	
Biospheric Values	0.02	0.14 **	−0.05	0.33 **	0.16 **	0.39 **	0.52 **	0.31 **	0.66 **	-
Climate Protection Intentions and Behavior	0.07	0.12 *	0.06	0.27 **	0.18 **	0.39 **	0.60 **	0.18 **	0.33 **	0.44 **

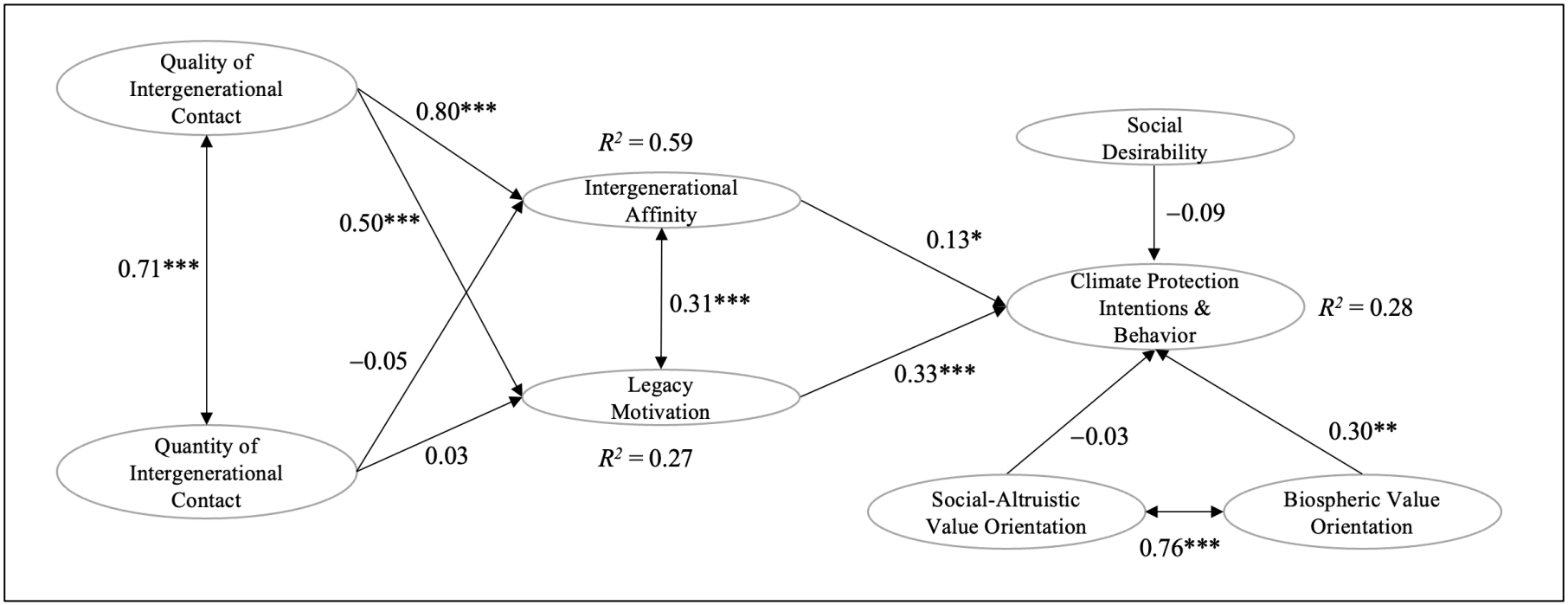
Note. Spearman's Rho was used to assess the bivariate correlations. * $p < 0.05$. ** $p < 0.01$.

5.2 Structural Model

The results of the Structural Model predicting participants' climate protection intentions and behavior can be found in Figure C.2, and the entire Structural Equation Model including the Measurement Model can be found in Appendix C.B (Figure C.A1). The postulated model had an acceptable to good model fit with a robust *CFI* = 0.87, robust *RMSEA* = 0.05, and *SRMR* = 0.07 (Hu & Bentler, 1999) and explained 28% of the variance in the criterion of climate protection intentions and behavior. In line with predictions, intergenerational affinity was explained by the quality of intergenerational contact ($\beta = 0.80$, $p < 0.001$), supporting Hypothesis H1.1. The quality of intergenerational contact also significantly predicted legacy motivation ($\beta = 0.50$, $p < 0.001$), supporting Hypothesis H1.3. As expected, intergenerational affinity and legacy motivation were positively related ($r = 0.31$, $p < 0.001$). The quantity was significantly related to the quality of intergenerational contact ($r = 0.71$, $p < 0.001$). However, it was not predictive of either intergenerational affinity ($\beta = -0.05$, $p = 0.49$) (rejecting Hypothesis H1.2) or legacy motivation ($\beta = 0.03$, $p = 0.73$) (rejecting Hypothesis H1.4). The participants' climate protection intentions and behavior were directly predicted by intergenerational affinity ($\beta = 0.13$, $p = 0.04$) and legacy motivation ($\beta = 0.33$, $p < 0.001$), supporting Hypotheses H1.5 and H1.6. Furthermore, the criterion was indirectly predicted by the quality of intergenerational contact, mediated through both intergenerational affinity ($\beta = 0.10$, $p = 0.04$) and legacy motivation ($\beta = 0.17$, $p < 0.001$), supporting Hypotheses H1.7 and H1.7. Hypotheses H1.8 and H1.9 had to be rejected since the quantity of intergenerational contact did not significantly predict the criterion. Of the three control variables, only the biospheric value orientation significantly explained climate protection with $\beta = 0.30$ ($p = 0.01$).

Figure C.2

Structural Model Predicting Climate Protection Intentions and Behaviors in Study 1



Note. Robust *CFI* = 0.87, robust *RMSEA* = 0.05, *SRMR* = 0.07. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

6. Discussion

The climate protection behaviors of older generations can be considered a form of intergenerational prosociality, as they primarily benefit young and future generations and may involve personal costs or sacrifices (De Groot & Steg, 2009; Oswald, 1996). The present study examined motivators of climate protection intentions and behaviors among older people by drawing on variables that have successfully promoted intergroup and intergenerational prosociality in the past.

As hypothesized, we found the participants' affinity with younger people to be predictive of the participants' climate protection intentions and behaviors. This suggests that the closer the older people felt to younger people, entailing a greater perspective taking, empathic concern, and perceived oneness, the more willing they were to protect the climate. This finding is in line with previous studies that found intergenerational affinity to predict intergenerational beneficence (Wade-Benzoni, 2008) and political solidarity (de Paula Sieverding et al., 2023).

In line with predictions, the participants' legacy motivation was a significant predictor of their climate protection intentions and behaviors. Since concerns about one's legacy include wanting to leave behind an intact world for future generations (Frumkin et al., 2012), taking action to mitigate the climate crisis is a powerful method to contribute to one's legacy. This result is consistent with previous evidence (Hurlstone et al., 2020; Wickersham et al., 2020; Zaval et al., 2015) showing that legacy motivation appeals to a longer-term and other-oriented perspective and thereby promotes prosocial behaviors toward future others and climate change protection behaviors.

The present study further investigated whether intergroup contact, which has been shown to be a powerful tool to increase intergroup prosociality, e.g., (e.g., Johnston & Glasford, 2018; Koschate et al., 2012), could also promote the intergenerational prosocial behavior of climate protection. Indeed, the quality of contact with younger people was indirectly related to the participants' climate protection intentions and behaviors, mediated by both intergenerational affinity and legacy motivation. Although no causal inferences can be drawn, these significant mediations suggest that positive intergenerational contact may bring generations closer together and appeal to older peoples' motivation to leave behind a positive legacy, in turn, promoting intergenerational prosociality.

In contrast, the quantity of the intergenerational contact was not significantly related to intergenerational affinity or legacy motivation, or indirectly related to the criterion. This result

is consistent with previous research findings on the ambiguous role of the quantity of contact in improving intergroup attitudes and the overshadowing role of the quality of contact (Islam & Hewstone, 1993).

While the present study focused on intergenerational drivers, we also controlled for known predictors of climate protection behaviors. As expected and in line with previous research, the participants' biospheric value orientation was an important predictor of their climate protection intentions and behaviors (Stern et al., 1999). However, the criterion was not related to the participants' social-altruistic value orientation or their social desirability, with the former possibly being due to the high correlation with biospheric values.

Taken together, the findings indicate that, in addition to basic ecological values, intergenerational variables also play a role in predicting climate protection intentions and behavior in older people and that climate protection may in turn indeed represent a form of intergenerational prosociality. Given the correlational nature of this first study and to gain a deeper understanding of the variable of intergenerational affinity, we conducted a second study.

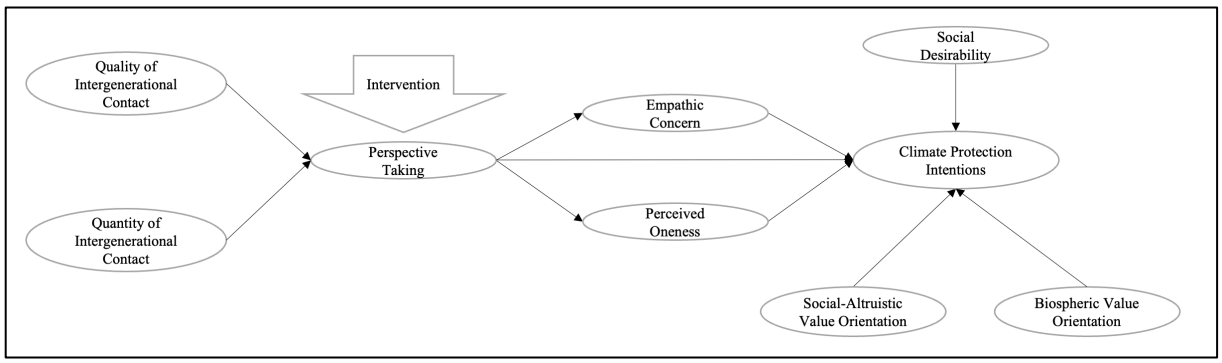
Study 2

Hypotheses

The second study was designed to test the causality of the relationship between intergenerational affinity and climate protection intentions of older people, and to gain insights about the subfacets of intergenerational affinity, namely perspective taking, empathic concern, and perceived oneness, and their respective interrelations and relationship with climate protection intentions. See Figure C.3 for the postulated model.

Figure C.3

Postulated Model Predicting Climate Protection Intentions in Study 2



To that end, we experimentally manipulated perspective taking toward younger people in line with previous studies using a text-reading intervention (Ortiz-Riomalo et al., 2021). The participants in Experimental Group 1 received a text describing the reality of a young person paired with the instruction to take the perspective of that person. The participants in Experimental Group 2 received the same text about that young person, but no perspective-taking instruction. The participants in the Control Group received a text describing the reality of an older person and no perspective-taking instruction.

We expected the perspective taking toward younger people to be highest among participants in Experimental Group 1, followed by participants from Experimental Group 2, and lowest among participants in the Control Group (Hypothesis H2.1). We expected both empathic concern (Hypothesis H2.2) and perceived oneness (Hypothesis H2.3) and the resulting climate protection intentions (Hypothesis H2.4) to be highest among participants in Experimental Group 1, followed by participants from Experimental Group 2, and lowest among participants in the Control Group. On a correlational level, we expected both the quality and quantity of intergenerational contact to explain the participants' domain-general perspective taking toward younger people (quality: Hypothesis H2.5; quantity: Hypothesis H2.6). Furthermore, we expected perspective taking to explain both empathic concern for (H2.7) and perceived oneness (H2.8) with younger people, and empathic concern (H2.9) and perceived oneness (H2.10) to predict climate protection intentions. As for mediation effects, we hypothesized that the quality and quantity of intergenerational contact can indirectly explain climate protection intentions, mediated through perspective taking and subsequently empathic concern toward younger people (quality: H2.11; quantity: H2.12) as well as through perspective taking and subsequently perceived oneness with younger people (quality: H2.13; quantity: H2.14).

We again controlled for the participants' social desirability tendencies and their social-altruistic and biospheric value orientations.

7. Methods

Similar to Study 1, Study 2 was designed and conducted in accordance with the APA guidelines for the ethical conduct of research and did not require ethical approval. Informed consent was obtained from all participants. The study was pre-registered (see https://aspredicted.org/X8P_2QJ (accessed on 4 January 2024)).

7.1 Data Collection and Participants

Data were collected online from 19 to 26 October 2023 through the online access panel provider Bilendi using the platform SoSciSurvey. Participants were financially compensated for their participation.

Of the 320 participants who passed the screening question ("This is a test question. Please tick 1: 'strongly disagree'") and the attention check question ("What was found in the lake?" Answer options: A bicycle; Blue-green algae; Evidence of contamination), 2 were excluded based on answer time (they finished the survey in less than three minutes when it took the other participants, average, about eight minutes) and 9 based on missing values (30% or more of the questions had missing values). No participants were excluded based on mechanical answer tendencies. The final sample consisted of $N = 309$. The answer time ranged from 3.20 to 19.53 min ($M = 7.77$, $SD = 2.75$). The final sample was representative of the German population aged 55 years and older regarding age distribution, gender, and education (Statistisches Bundesamt, 2020). A total of 140 of the participants identified with the male gender, 168 with the female gender, and 1 identified as diverse. The ages ranged from 55 to 86 years ($M = 65.57$, $SD = 6.57$).

7.2 Procedure

After providing their sociodemographic information and reporting the quantity and quality of their intergenerational contact, participants were randomly assigned to one of the three perspective-taking conditions. After reading the respective text, they all completed an attention check to ensure that they cautiously read the text. Participants then completed the questions for the perceived oneness, perspective-taking, and empathic concern measures, followed by the questions for the climate protection intention measure. They finished the survey by completing the questions for the social-altruistic and biospheric value orientations and social desirability scales.

7.3 Measures

Prior to the questions related to young people, participants were given the information that in the present study, young people were understood as people up to the age of 25. The quantity of intergenerational contact, perceived oneness, perspective taking, and empathic concern for young people, social-altruistic and biospheric value orientations, and social desirability were assessed with the same scales that were used in Study 1. The quality of intergenerational contact was measured with one item: "How would you rate your contact with young people?" adapted from Bousfield and Hutchison (2010). The answers were assessed on

a five-point-Likert rating scale (1 = *very negative* to 5 = *very positive*). Climate protection intentions were assessed with the same 20 items used in Study 1. The question, however, read: "The following question refer to different climate protection behaviors and whether you plan to implement them in the near future. If a question does not apply to you because, for example, you do not have a car to replace, please tick "not applicable". Unlike in Study 1, the answer options were limited to future oriented intentions and did not include past behavior. The answers were assessed on a five-point-Likert response scale (1 = *no, definitely not* to 5 = *yes, definitely*). All measures can be found in Appendix C.A.

7.4 Manipulation of Perspective Taking

In line with previous studies, we manipulated perspective taking toward one person as a means to trigger perspective taking (Batson et al., 2002; Pagotto, 2010), empathic concern (e.g., (see, e.g., Batson et al., 1997a; Maner et al., 2002)), and perceived oneness with that person's social group (Galinsky & Moskowitz, 2000; Pagotto, 2010). Following Batson et al. (1997a), we focused the 'imagine-other' perspective, since this kind of perspective taking has shown to evoke empathy, which in turn, induces altruistic motivations, as opposed to the 'imagine-self' perspective, which has been shown to evoke both empathy and personal distress, resulting in egoistic motivations.

Participants were randomly assigned to one of three conditions. Participants in all three conditions received a text describing the reality of a person, and the instruction to carefully read the text.

The two experimental conditions were presented the following text:

"Maya is 17 years old and lives with her mother and 14-year-old brother in a small town in northwestern Germany. She is in grade 11 at the local high school and still has a little more than a year and a half of school ahead of her before she will graduate in the summer of 2025. She is not yet sure what she wants to do afterwards. One option she can imagine is training to be a paramedic, as she likes being with people, is interested in medicine, and wants to work hands-on. Now that her high school graduation is approaching, she has to do more for school than she used to. But she still has time to go to handball in the evening or do something with her friends. Actually, they were supposed to meet at the lake tonight, which she had been looking forward to all week, especially since it's so hot again this summer. Yesterday, however, there was a report that blue-green algae had been found in the lake—alternatively, there was only one lake further away. But most of her friends can't afford the Germany ticket, they therefore cancelled the lake trip. At the moment she is dealing with a conflict with her best

friend who recently started her first relationship and is much less interested in Maya since then. At the same time, Maya has some issues that are bothering her: Her father is desperate to get her a boring internship with a family friend, she's newly in love, and she always has to do more chores than her brother. And on top of that, she's thinking a lot about what she's going to do after school, and it would be cool to be able to talk about it with her best friend."

The two experimental conditions differed in the instructions. In Experimental Group 1, participants received the following instruction: "While reading the text, try to imagine how the person described perceives their situation and how they feel. The goal is not to concern yourself with all the information, but to put yourself in the situation of the person described as best you can".

In Experimental Group 2, participants received no instruction other than to read the text carefully. They were then presented with the same text describing Maya's reality as Experimental Group 1. In agreement with Ortiz-Riomalo et al. (2021), we expected the mere presentation of the text describing the reality of a young person to increase perspective taking and in turn perceived oneness and empathic concern. Unlike them, however, we did not consider this condition to be a control condition but rather a weaker intervention condition.

In the Control Group, we presented the participants with a text describing the reality of a person falling into our "older people" category (aged 58) and no further instruction other than to read the text carefully. We thereby opted for a different approach than previous studies, e.g., (see, e.g., Batson et al., 2002; Batson et al., 1997a), who presented the participants in the control condition with the same text as the treatment group and the instruction to remain objective and focus on the facts while reading the text. We chose this approach because we assumed that the mere presentation of the text, which describes the reality of a young person's life, would increase perspective taking and also increase ecological validity. The full text can be found in Appendix C.A.

7.5 Planned Statistical Analyses

To gain an overview of the data, we first examined the descriptive statistics and bivariate correlations of the central variables. We then tested whether the experimental manipulation of the participants' perspective taking toward younger people using the text-reading intervention was successful via ANCOVA. The participants were randomly assigned to Experimental Group 1: text about young person and perspective taking instruction; Experimental Group 2: only given text about young person; and Control Group: text about older person. The experimental group was entered as an independent variable, the quality and quantity of intergenerational

contact were entered as covariates, and perspective taking toward younger people represented the dependent variable and manipulation check. We further computed three separate ANCOVAS on empathic concern for and perceived oneness with younger people and climate protection intentions as dependent variables.

In addition to testing the effect of the perspective-taking intervention, we tested the postulated model shown in Figure C.3 via the Structural Equation Model.

8. Results

8.1 Descriptive Statistics

The scale ranges, means, standard deviations, and scale reliabilities for the central variables can be found in Table C.3. The bivariate correlations of the central variables and sociodemographic variables can be found in Table C.4. The criterion, climate protection intentions, was positively related to all potential predictors and the social-altruistic and biospheric value orientations. Furthermore, it was associated with gender, with women expressing higher intentions to protect the climate. No associations were found with age, education, or social desirability. To enable a comparison with results of Study 1, the overall construct of affinity was included in the correlation table in addition to its three subfacets.

Table C.3

Scale Ranges, Means, Standard Deviations, and Scale Reliabilities for the Central Variables

	Scale Range	***M***	***SD***	**ω**
Contact Quantity	1 to 5	3.15	1.11	/
Contact Quality	1 to 5	4.05	0.91	/
Perspective Taking	1 to 5	3.70	0.87	0.84
Perceived Oneness	1 to 5	3.13	0.95	0.76 $^{+}$
Empathic Concern	1 to 5	3.60	0.79	0.92
Climate Protection Intention	1 to 5	2.81	0.81	0.87
Social Desirability	1 to 5	2.77	0.43	0.60
Social-Altruistic Values	−1 to 7	6.02	0.95	0.78
Biospheric Values	−1 to 7	5.55	1.19	0.85

Note. McDonald's Omega was used to assess scale reliabilities except for perceived oneness, for which, the Cronbach's Alpha ($^{+}$) was computed.

Table C.4

Bivariate Correlations of Sociodemographic Variables and the Central Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
Experimental Condition (1)	-												
Age (2)	0.08	-											
Gender (3)	0.05	−0.03	-										
Education (4)	−0.04	0.00	−0.02	-									
Contact Quality (5)	−0.04	0.06	0.15 **	0.03	-								
Contact Quantity (6)	0.06	−0.07	0.12 *	0.11	0.46 **	-							
Affinity (7)	0.00	0.02	0.21 **	0.04	0.61 **	0.50 **	-						
Perspective Taking (8)	−0.03	−0.08	0.21 **	0.00	0.51 **	0.43 **	0.84 **	-					
Empathic Concern (9)	0.00	0.07	0.18 **	0.06	0.59 **	0.38 **	0.92 **	0.65 **	-				
Perceived Oneness (10)	0.02	0.01	0.13 *	0.00	0.44 **	0.53 **	0.75 **	0.54 **	0.58 **	-			
Social Desirability (11)	−0.03	−0.02	−0.16 **	−0.03	0.07	0.06	0.14 *	0.10	0.13 *	0.12 *	-		
Social-Altruistic Values (12)	0.03	0.14 *	0.09	−0.05	0.31 **	0.09	0.41 **	0.30 **	0.46 **	0.22 **	0.14 *	-	
Biospheric Values (13)	0.10	0.08	0.16 **	0.00	0.14 *	−0.01	0.30 **	0.25 **	0.31 **	0.19 **	0.04	0.65 **	-
Climate Protection I. (14)	0.15 **	0.09	0.12 *	0.11	0.15 *	0.16 **	0.32 **	0.18 **	0.32 **	0.23 **	0.04	0.32 **	0.47 **

Note. Spearman's Rho was used to assess bivariate correlations. * $p < 0.05$. ** $p < 0.01$.

8.2 Evaluation of the Intervention

We computed four ANCOVAs to test whether the experimental manipulation of the participants' perspective taking toward young people (H2.1) and the subsequent variables empathic concern (H2.2), perceived oneness (H2.3), and climate protection intentions (H2.4) were successful. The descriptive statistics of these four variables for each experimental condition (unadjusted and adjusted for the covariates) can be found in Appendix C.C in Tables C.A7, C.A9, C.A11 and C.A13, with Table C.A7 furthermore depicting the descriptive statistics for the two covariates quality and quantity of intergenerational contact. The results for the four separate ANCOVAs can be found in Appendix C.C, Tables C.A8, C.A10, C.A12 and C.A14. The results indicate that the experimental condition did not significantly affect the participants' perspective taking toward, empathic concern for, or perceived oneness with younger people. Hypotheses H2.1 to H2.3 were therefore rejected, and we concluded that the intervention was not successful. Yet, the results of the fourth ANCOVA (Table C.A12) revealed that the experimental condition had a significant effect on the participants' climate protection intentions, with there being a significant mean difference of $M_{diff} = 0.28$ ($p = 0.04$) between Experimental Group 1 ($M = 2.64$, $SD = 0.76$) and the Control Group ($M = 2.93$, $SD = 0.88$). With this effect that was the opposite to the expected one, Hypothesis H2.4 was also rejected.

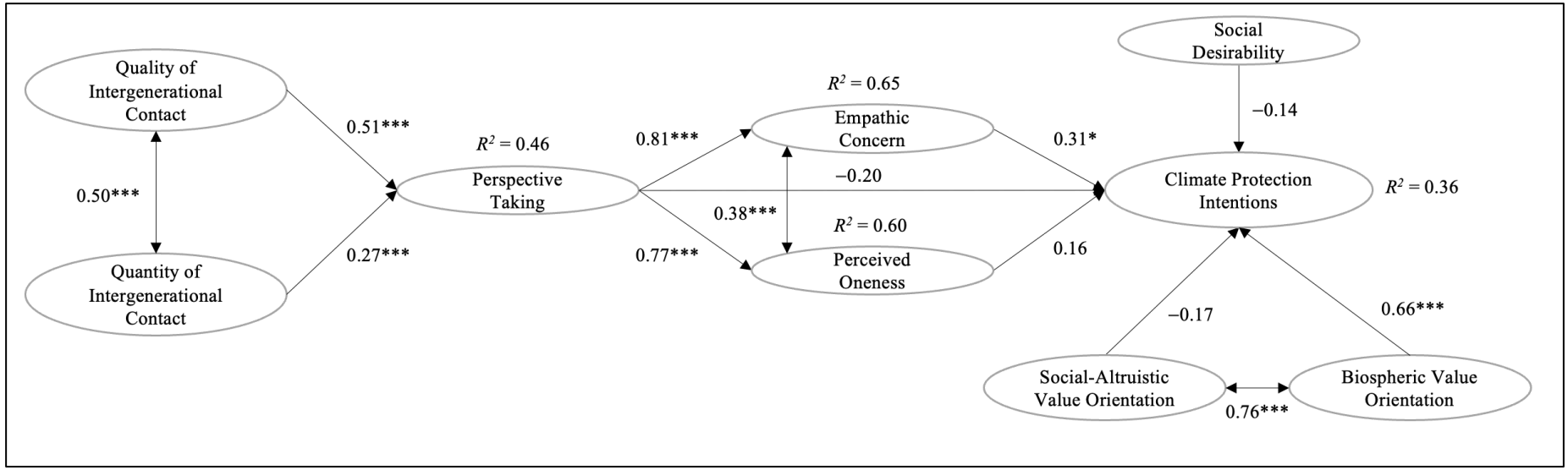
8.3 Structural Model

The results of the Structural Model in predicting the participants' climate protection intentions can be found in Figure C.4; the entire Structural Equation Model including the Measurement Model can be found in Appendix C.C (Figure C.A2). The postulated model had an acceptable to good model fit with a robust $CFI = 0.90$, robust $RMSEA = 0.05$, and $SRMR = 0.08$ (Hu & Bentler, 1999), and explained 36% of the variance in the criterion of climate protection intentions. Supporting hypotheses H2.5 and H2.6, perspective taking toward younger people was positively explained by the quality ($\beta = 0.51$, $p < 0.001$) and the quantity of intergenerational contact ($\beta = 0.27$, $p < 0.001$). The quality and quantity of contact were both positively related ($r = 0.50$, $p < 0.001$). In line with predictions, perspective taking toward younger people explained the empathic concern for ($\beta = 0.81$, $p < 0.001$) and perceived oneness ($\beta = 0.77$, $p < 0.001$) with them, supporting Hypotheses H2.7 and H2.8. Empathic concern and perceived oneness were positively related ($r = 0.38$, $p < 0.001$). As predicted, empathic concern for younger people explained the participants' intentions to protect the climate ($\beta = 31$, $p = 0.03$), supporting Hypothesis H2.9. However, we had to reject Hypothesis H2.10 as perceived oneness with younger people was not predictive of the criterion ($\beta = 0.16$, $p = 0.25$).

As for the mediation effects, both quality (β = 0.13, p = 0.04) and quantity (β = 0.07, p = 0.04) indirectly predicted participants' climate protection intentions, mediated through first, perspective taking and subsequently, empathic concern for younger people, supporting Hypotheses H2.11 and H.12. Hypotheses H2.13 and H.14 had to be rejected as the indirect effects of quality (β = 0.06, p = 0.26) and quantity (β = 0.03, p = 0.28) on the criterion mediated by perspective taking and perceived oneness were not significant. Of the three control variables, only the biospheric value orientation significantly explained climate protection intentions (β = 0.66, p < 0.001).

Figure C.4

Structural Model Predicting Climate Protection Intentions in Study 2



Notes. Robust *CFI* = 0.90, robust *RMSEA* = 0.05, *SRMR* = 0.08. * $p < 0.05$. *** $p < 0.001$.

9. Discussion

The aim of Study 2 was to test the relationships between the intergenerational affinity subfacets and potential causal effects of perspective taking toward younger people on older people's climate protection intentions through an intervention.

The results of the ANCOVAs show that perspective taking toward young people did not differ across the three different experimental conditions when the quality and quantity of intergenerational contact were controlled for. Accordingly, the experimental condition did not have an effect on the subsequent variables of perceived oneness with and empathic concern for younger people either.

This result suggests that our manipulation was not effective. There are several possible reasons for this result. First, unlike in other studies, (e.g., Batson et al., 2002; Batson et al., 1997c), the participants in our control condition did not receive the same text describing the reality of the same person with the instruction to remain objective and detached. Instead, they were given a text describing the reality of a person who did not belong to the social group with which perspective taking was to be increased in the other groups. It is possible that the instruction to remain objective and detached may reduce the existing perspective taking tendencies with the target group among participants in the control condition. This leads us to the second possible reason why the manipulation may have failed. The average perspective taking toward younger people was quite high in all three conditions, possibly because younger people represent a less specific and less marginalized group than the groups that many previous studies have focused on and successfully manipulated perspective taking, such as toward drug addicts. There was therefore less room for "improvement" through the intervention. Also, in contrast to most studies in which perspective taking was manipulated (Batson et al., 2002; Ortiz-Riomalo et al., 2021), the person described in our two experimental conditions was not a person in need. The perception of need is considered an important prerequisite for perspective taking. We explicitly chose not to incorporate younger people's needs in relation to the climate crisis, as we assumed that mentioning the adverse climate crisis consequences would be dominant in predicting climate protection intentions, which would have made it very difficult for us to detect a potential effect of perspective taking toward younger people.

However, the perspective taking condition significantly predicted the participants' climate protection intentions in the direction opposite to the prediction: the participants in the Control Group reported significantly higher climate protection intentions than the participants in the two other conditions. Since the groups did not differ significantly with regard to other

relevant predictors of climate protection intentions (e.g., biospheric value orientation and quantity and quality of intergenerational contact) and given the relatively small sample size, we assume that this finding might be an incidental finding.

Our failure to manipulate perspective taking toward younger people does however not mean that perspective taking may not have an influence on empathic concern for and perceived oneness with younger people, and in turn, climate protection intentions among older people. Firstly, the results of the SEM suggest that the participants' domain-general perspective taking toward younger people was positively related to their perceived oneness with and empathic concern for younger people. This is consistent with previous research on the interrelation of these variables. The decomposition of affinity was therefore successful, which was also supported by the acceptable to good model fit.

Secondly, perspective taking predicted participants' climate protection intentions mediated by empathic concern for younger people. This finding is in line with previous studies showing that perspective taking toward a member of a group promotes prosocial behavior toward the whole group by increasing empathic concern for them, e.g., (e.g., Batson et al., 2002). However, no mediating effect was found for perceived oneness. This result suggests that, when studied simultaneously, it is empathic concern for younger people that is relevant for climate protection and not the perceived oneness with them. One potential explanation might be that perspective taking and empathy focus on the other group and their experiences, while perceived oneness focuses more on the interconnectedness the individual feels with the other group (Pagotto, 2010).

Thirdly, and consistent with Study 1, both the quality and quantity of intergenerational contact were relevant indirect predictors of climate protection intentions, mediated by the affinity variables of perspective taking and empathic concern. This again suggests that contact between different groups has the potential to bring them closer together and thereby increase intergroup prosociality.

10. General Discussion

10.1 Prediction of Climate Protection Intentions and Behavior

The climate crisis is one of the dominant crises of our time and the future, with generational affiliation influencing affectedness, contribution, and mitigation power. In two studies (Study 1: $N = 411$ Germans aged 55 to 75; Study 2: $N = 309$ Germans aged 55 to 86), the present paper investigated the climate protection intentions and behaviors in older people. On a correlational level, both studies agree that older people's climate protection intentions and

behaviors can be directly explained by intergenerational affinity. Study 2 shed further light on the subfacets of affinity, revealing that, as predicted, older people's perspective taking toward younger people was related to empathic concern for them, which in turn, was related to their climate protection intentions. Yet, as the manipulation of perspective taking toward younger people was not successful in Study 2, causal conclusions could not be drawn. In both studies, the affinity variables mediated the effect of the quality of intergenerational contact on climate protection. In Study 2, the quantity of intergenerational contact also indirectly explained the criterion. In line with previous studies, Study 1 provided evidence that legacy motivation plays a role in explaining older people's climate protection intentions and behavior, e.g., (e.g., Hurlstone et al., 2020)**,** and represents an additional mediator of the effect of the quality of intergenerational contact.

10.2 Limitations

The two studies presented come with several limitations that need to be considered when interpreting the results. While the two studies combined had a sample size of 720, a larger sample size in each study would have yielded more robust findings.

Although digital literacy is increasing among older adults (Mace et al., 2022), the present studies relied solely on online questionnaires for data collection, which could limit the generalizability of the results despite the samples being representative.

In both studies, the postulated models explained only a relatively small portion of the variance, especially when not considering the control variable biospheric value orientation. We did not integrate other known predictors of climate protection behaviors, such as personal norms, habits, or perceived behavior control (see (see Klöckner, 2013 for a meta-analysis), for a meta-analysis). Including these would certainly have allowed for a better explanation of the criteria. However, our main goal was to study the potential effects of intergenerational variables, not to exhaustively predict climate protection intentions and behaviors.

An important limitation of the second study is the failed manipulation of perspective taking toward younger people. As discussed in the Discussion section of Study 2, this failed manipulation could be due to the design of the control condition or the choice of the group that was targeted for the perspective taking. As a result of the failed manipulation, all the findings are only of a correlational nature and no causal inferences can be drawn.

A final limitation is that we did not explicitly assess whether the older people examined exhibited climate protection behaviors for the benefit of younger people. Interpreting the climate protection of the participants as an act of prosociality toward young people should

therefore be performed with caution. However, pro-environmental and climate protection behaviors are repeatedly considered as a form of prosocial behavior (de Groot & Steg, 2008), and young and future generations are among the groups that will benefit most from climate protection. Furthermore, since our studies provide evidence that the intergenerational variables of quality of contact, intergenerational affinity, and legacy motivation explain climate protection beyond the influence of biospheric value orientation, we assume that intergenerational considerations play a role in climate protection, at least in part and for some older people.

10.3 Implications for Future Research and Practice

The present study is among the first to examine whether intergenerational contact, a proven predictor of intergroup prosociality, might promote older people's climate protection intentions and behaviors. Future studies should test the causality of this relationship by manipulating the quality of contact between generations.

As the present study did not succeed in manipulating perspective taking toward younger people, future studies could use other intervention designs to assess the potential of influencing perspective taking toward younger people to affect climate change behaviors among older people. A stronger intervention in the experimental group, or providing the control group with the same text regarding the younger person in the control group with the instruction to remain detached and objective, as was performed in other studies (e.g., (e.g., Batson et al., 2002)), might have successfully manipulate perspective taking toward younger people. Another possibility, given the relatively high overall perspective taking toward younger people, would be to choose younger people who are affected by climate crisis consequences, or even future generations, as target groups.

Future studies could test the claim that climate protection behaviors represent a form of intergenerational prosociality by explicitly examining the relative importance of intergenerational predictors in comparison to other variables known to promote climate protection behaviors.

Although the present research only provides initial and correlational insights into intergenerational motivators of older people's climate protection behaviors, it has several potential practical implications. The bottom line of both studies is that the closer older people feel to younger people, the more willing they are to protect the climate. Facilitating contact between different generations, e.g., via intergenerational tutoring programs such as computer courses for the elderly, might be a promising starting point to bridge the gap between

generations and thereby promote intergenerational affinity and legacy motivation. Greater representation and visibility of younger generations, their realities and experiences in the media, e.g., in television programs aimed at older groups, might create indirect intergenerational experiences. This might facilitate an intergenerational understanding and perspective taking and lead to people taking the other generation into account in their actions.

Another potential approach to promote intergenerational prosociality and climate protection behaviors might be to make people aware of the long-term impact they and their actions have on both people and the world that they will leave behind, thus appealing to their legacy motivation.

11. Conclusions

The climate crisis affects young and future generations disproportionally and thereby poses a major threat to sustainability. Yet, while the intergenerational dynamics of the climate crisis are being widely discussed, more research is needed on the contribution that intergenerational variables could make in predicting and thus promoting the urgently needed climate protection behaviors of older generations. The present research considers older people's climate protection behaviors as an act of intergenerational prosociality toward young and future generations and therefore drew on variables that, in the past, have successfully predicted prosociality between groups as potential predictors. The first study produced correlational evidence on the promoting roles of intergeneration contact and affinity and the motivation to leave behind a positive legacy in older people's climate protection intentions and behaviors. Although the experimental manipulation of the affinity subfacet of perspective taking toward younger people failed, the second study produced additional evidence on the positive role of intergenerational contact for older people's climate protection intentions and provided deeper insights into the subfacets of intergenerational affinity. Both studies suggest that bridging the gap between older and younger generations might be a promising starting point for promoting climate protection behaviors.

Author Contributions: Conceptualization, T.d.P.S., K.S., and V.K.; methodology, T.d.P.S., K.S., and V.K.; formal analysis, T.d.P.S.; investigation, T.d.P.S., K.S., and V.K.; resources, T.d.P.S.; data curation, T.d.P.S.; writing—original draft preparation, T.d.P.S., K.S., and V.K.; writing—review and editing, T.d.P.S., K.S., and V.K.; visualization, T.d.P.S.; supervision, K.S.; project administration, T.d.P.S.; funding acquisition, T.d.P.S. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Deutsche Bundesstiftung Umwelt (grant number 20020/692).

Institutional Review Board Statement: Ethical review and approval were waived for this study since according to German law, survey studies do not require ethical approval if anonymity is guaranteed and no sensitive content is assessed.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Acknowledgments: We thank Josephine Bokowski for her support in formatting the manuscript. We acknowledge support by the Open Access Publication Fund of Magdeburg University.

Conflicts of Interest: The authors declare no conflicts of interest.

References

Allport, G. W. (1954). *The Nature of Prejudice*. Addison Wesley.

Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, *63*(4), 596. https://doi.org/10.1037/0022-3514.63.4.596

Bang, H. M., Koval, C. Z., & Wade-Benzoni, K. A. (2017). It's the thought that counts over time: The interplay of intent, outcome, stewardship, and legacy motivations in intergenerational reciprocity. *Journal of Experimental Social Psychology*, *73*, 197-210. https://doi.org/10.1016/j.jesp.2017.07.006

Batson, C. D. (1987). Prosocial motivation: Is it ever truly altruistic? *Advances in Experimental Social Psychology*, *20*, 65-122. https://doi.org/10.1016/S0065-2601(08)60412-8

Batson, C. D., & Ahmad, N. Y. (2009). Using empathy to improve intergroup attitudes and relations. *Social Issues and Policy Review*, *3*(1), 141-177. https://doi.org/10.1111/j.1751-2409.2009.01013.x

Batson, C. D., Chang, J., Orr, R., & Rowland, J. (2002). Empathy, attitudes, and action: Can feeling for a member of a stigmatized group motivate one to help the group? *Personality and Social Psychology Bulletin*, *28*(12), 1656-1666. https://doi.org/10.1177/014616702237647

Batson, C. D., Early, S., & Salvarani, G. (1997). Perspective Taking: Imagining How Another Feels Versus Imaging How You Would Feel. *Personality and Social Psychology Bulletin*, *23*(7), 751-758. https://doi.org/10.1177/0146167297237008

Batson, C. D., Lishner, D. A., & Stocks, E. L. (2015). The Empathy—Altruism Hypothesis. In D. A. Schroeder & W. G. Graziano (Eds.), *The Oxford handbook of prosocial behavior* (pp. 259–281). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780195399813.013.023

Batson, C. D., Polycarpou, M. P., Harmon-Jones, E., Imhoff, H. J., Mitchener, E. C., Bednar, L. L., Klein, T. R., & Highberger, L. (1997). Empathy and attitudes: Can feeling for a member of a stigmatized group improve feelings toward the group? *Journal of Personality and Social Psychology*, *72*(1), 105. https://doi.org/10.1037/0022-3514.72.1.105

Batson, C. D., Sager, K., Garst, E., Kang, M., Rubchinsky, K., & Dawson, K. (1997). Is empathy-induced helping due to self–other merging? *Journal of Personality and Social Psychology*, *73*(3), 495. https://doi.org/10.1037/0022-3514.73.3.495

Batson, C. D., Sager, K., Garst, E., Kang, M., Rubchinsky, K., & Dawson, K. (1997). Is Empathy-Induced Helping Due to Self–Other Merging? *Journal of Personality and Social Psychology*, *73*, 495-509. https://doi.org/10.1037/0022-3514.73.3.495

Bousfield, C., & Hutchison, P. (2010). Contact, anxiety, and young people's attitudes and behavioral intentions towards the elderly. *Educational Gerontology*, *36*(6), 451-466. https://doi.org/10.1080/03601270903324362

Brown, R., Eller, A., Leeds, S., & Stace, K. (2007). Intergroup contact and intergroup attitudes: A longitudinal study. *European Journal of Social Psychology*, *37*(4), 692-703. https://doi.org/10.1002/ejsp.384

Brundtland, G. H. (1987). *Our Common Future: Report of the World Commission on Environment and Development*.

Cadieux, J. (2018). Intergenerational Contact Predicts Attitudes Toward Older

Adults Through Inclusion of the Outgroup in the Self. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 575-584. https://doi.org/10.1093/geronb/gbx176

Cialdini, R. B., Brown, S. L., Lewis, B. P., Luce, C., & Neuberg, S. L. (1997). Reinterpreting the empathy–altruism relationship: When one into one equals oneness. *Journal of Personality and Social Psychology*, *73*(3), 481-494. https://doi.org/10.1037/0022-3514.73.3.481

Davis, M. H. (1983). Measuring individual differences in empathy: evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, *44*(1), 113.

De Groot, J. I., & Steg, L. (2009). Morality and prosocial behavior: The role of awareness, responsibility, and norms in the norm activation model. *The Journal of Social Psychology 149*(4), 425-449. https://doi.org/10.3200/SOCP.149.4.425-449

de Groot, J. I. M., & Steg, L. (2008). Value Orientations to Explain Beliefs Related to Environmental Significant Behavior:How to Measure Egoistic, Altruistic, and Biospheric Value Orientations. *Environment and Behavior*, *40*(3), 330-354. https://doi.org/10.1177/0013916506297831

de Paula Sieverding, T., Merten, M., & Kastner, K. (2023). Old for young: Cross-national examination of intergenerational political solidarity. *Group Processes & Intergroup Relations*, 13684302231201785. https://doi.org/10.1177/13684302231201785

Frumkin, H., Fried, L., & Moody, R. (2012). Aging, climate change, and legacy thinking. *Am J Public Health*, *102*(8), 1434-1438. https://doi.org/10.2105/ajph.2012.300663

Galinsky, A. D., & Moskowitz, G. B. (2000). Perspective-taking: decreasing stereotype expression, stereotype accessibility, and in-group favoritism. *Journal of Personality and Social Psychology*, *78*(4), 708-724. https://doi.org/10.1037/0022-3514.78.4.708

Hale, N. M. (1998). Effects of Age and Interpersonal Contact on Stereotyping of the Elderly. *Current Psychology*, *17*, 28-38. https://doi.org/10.1007/s12144-998-1019-2

Hässler, T., Ullrich, J., Bernardino, M., Shnabel, N., Laar, C. V., Valdenegro, D., Sebben, S., Tropp, L. R., Visintin, E. P., & González, R. (2020). A large-scale test of the link between intergroup contact and support for social change. *Nature Human Behaviour*, *4*(4), 380-386. https://doi.org/10.1038/s41562-019-0815-z

Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal 6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Hurlstone, M. J., Price, A., Wang, S., Leviston, Z., & Walker, I. (2020). Activating the legacy motive mitigates intergenerational discounting in the climate game. *Global Environmental Change*, *60*, 102008. https://doi.org/10.1016/j.gloenvcha.2019.102008

IPCC. (2023a). *FAQ 3: How will climate change affect the lives of today's children tomorrow, if no immediate action is taken?* Retrieved 02-01-2024 from https://www.ipcc.ch/report/ar6/wg2/about/frequently-asked-questions/keyfaq3/

IPCC. (2023b). *Longer Report. Synthesis Report of the IPCC Sixth Assessment Report*.

Islam, M. R., & Hewstone, M. (1993). Dimensions of contact as predictors of intergroup anxiety, perceived out-group variability, and out-group attitude: An integrative model. *Personality and Social Psychology Bulletin*, *19*(6), 700-710. https://doi.org/10.1177/0146167293196005

Jang, H. (2022). Perspective-taking of a similarly-situated single victim increases donations for multiple victims. *Journal of Philanthropy and Marketing*, *27*(4), e1743. https://doi.org/10.1002/nvsm.1743

John, A., & R., P. (1994). An Overlapping Generations Model of Growth and the Environment. In R. P. A. John (Ed.), *Distributional Effects of Environmental and Energy Policy* (Vol. 104, pp. 1393-1410).

Johnston, B. M., & Glasford, D. E. (2018). Intergroup contact and helping: How quality contact and empathy shape outgroup helping. *Group Processes & Intergroup Relations*, *21*(8), 1185-1201. https://doi.org/10.1177/136843021771177

Kemper, C. J., Beierlein, C., Bensch, D., Kovaleva, A., & Rammstedt, B. (2012). Eine Kurzskala zur Erfassung des Gamma-Faktors sozial erwünschten Antwortverhaltens: Die Kurzskala Soziale Erwünschtheit-Gamma (KSE-G). In: GESIS – Leibniz-Institut für Sozialwissenschaften.

Klöckner, C. A. (2013). A comprehensive model of the psychology of environmental behaviour—A meta-analysis. *Global Environmental Change 23*(5), 1028-1038. https://doi.org/10.1016/j.gloenvcha.2013.05.014

Koschate, M., Oethinger, S., Kuchenbrandt, D., & Van Dick, R. (2012). Is an outgroup member in need a friend indeed? Personal and task-oriented contact as predictors of intergroup prosocial behavior. *European Journal of Social Psychology*, *42*(6), 717-728. https://doi.org/10.1002/ejsp.1879

Levine, M., Prosser, A., Evans, D., & Reicher, S. (2005). Identity and Emergency Intervention: How Social Group Membership and Inclusiveness of Group Boundaries Shape Helping Behavior. *Personality and Social Psychology Bulletin*, *31*(4), 443-453. https://doi.org/10.1177/0146167204271651

Lolliot, S., Fell, B., Schmid, K., Wölfer, R., Swart, H., Voci, A., Christ, O., New, R., & Hewstone, M. (2015). Measures of intergroup contact. *Measures of Personality and Social Psychological Constructs*, 652-683. https://doi.org/10.1016/B978-0-12-386915-9.00023-1

Mace, R. A., Mattos, M. K., & Vranceanu, A. M. (2022). Older adults can use technology: why healthcare professionals must overcome ageism in digital health. *Transl Behav Med*, *12*(12), 1102-1105. https://doi.org/10.1093/tbm/ibac070

Maner, J. K., Luce, C. L., Neuberg, S. L., Cialdini, R. B., Brown, S., & Sagarin, B. J. (2002). The effects of perspective taking on motivations for helping: Still no evidence for altruism. *Personality and Social Psychology Bulletin*, *28*(11), 1601-1610. https://doi.org/10.1177/014616702237586

Matthies, E., de Paula Sieverding, T., Engel, L., & Blöbaum, A. (2023). Simple and Smart: Investigating Two Heuristics That Guide the Intention to Engage in Different Climate-Change-Mitigation Behaviors. *Sustainability*, *15*(9), 7156. https://doi.org/10.3390/su15097156

Ortiz-Riomalo, J. F., Koessler, A.-K., & Engel, S. (2021). Inducing perspective-taking for prosocial behaviour in natural resource management. *Journal of Environmental Economics and Management*, *110*, 102513. https://doi.org/10.1016/j.jeem.2021.102513

Oswald, P. A. (1996). The effects of cognitive and affective perspective taking on empathic concern and altruistic helping. *The Journal of Social Psychology*, *136*(5), 613-623. https://doi.org/10.1080/00224545.1996.9714045

Otten, S., & Moskowitz, G. B. (2000). Evidence for Implicit Evaluative In-Group Bias: Affect-Biased Spontaneous Trait Inference in a Minimal Group Paradigm. *Journal of Experimental Social Psychology*, *36*(1), 77-89. https://doi.org/10.1006/jesp.1999.1399

Pagotto, L. (2010). *The interplay of empathy, oneness and perceived similarity in mediating the effects of perspective taking on prosocial responses* (Publication Number 146905452) [Doctoral Dissertation, Università di Padova]. Semantic Scholar. https://www.semanticscholar.org/paper/The-interplay-of-empathy%2C-oneness-and-perceived-in-Pagotto/b7c380cc00760fc5451475d3dfa59161d13cbf43

Pettigrew, T. F., & Tropp, L. R. (2006). A Meta-Analytic Test of Intergroup Contact Theory. *Journal of personality and social psychology*, *90*(5), 751–783.

Pettigrew, T. F., & Tropp, L. R. (2008). How does intergroup contact reduce prejudice? Meta-analytic tests of three mediators. *European Journal of Social Psychology*, *38*(6), 922-934. https://doi.org/10.1002/ejsp.504

Ritchie, H., & Roser, M. (2019). *Age Structure*. Retrieved 12-07-2023 from https://ourworldindata.org/age-structure

Schmitt, E., Hinner, J., & Kruse, A. (2011). Dialogue between generations–basic ideas, implementation and evaluation of a strategy to increase generativity in post-soviet societies. *Procedia-Social and Behavioral Sciences*, *12*, 300-310. https://doi.org/10.1016/j.sbspro.2011.02.039

Statistisches Bundesamt. (2020). *Bevölkerung im Alter von 15 Jahren und mehr nach allgemeinen und beruflichen Bildungsabschlüssen nach Jahren*. Retrieved 03-01-2023 from https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bildung-Forschung-Kultur/Bildungsstand/Tabellen/bildungsabschluss.html#fussnote-1-104098

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. *Human Ecology Review* 81-97.

Stern, P. C., Dietz, T., & Guagnano, G. A. (1998). A brief inventory of values. *Educational and Psychological Measurement 58*(6), 984-1001. https://doi.org/10.1177/0013164498058006008

Stockemer, D., & Sundström, A. (2023). Age Inequalities in Political Representation: A Review Article. *Government and Opposition*, 1-18. https://doi.org/10.1017/gov.2023.11

Turner, J. C. (1975). Social Comparison and Social Identity: Some Prospects for Intergroup Behaviour. *European Journal of Social Psychology*, *5*(1), 1-34. https://doi.org/10.1002/ejsp.2420050102

Vesely, S., & Klöckner, C. A. (2020). Social desirability in environmental psychology research: Three meta-analyses. *Frontiers in Psychology*, *11*, 1395. https://doi.org/10.3389/fpsyg.2020.01395

Wade-Benzoni, K. A. (1999). Thinking about the future: An intergenerational perspective on the conflict and compatibility between economic and environmental interests. *American Behavioral Scientist*, *42*(8), 1393-1405. https://doi.org/10.1177/00027649921954912

Wade-Benzoni, K. A. (2003). Intergenerational identification and cooperation in organizations and society. *Research on Managing Groups and Teams*, *5*, 257–277. https://doi.org/https://doi.org/10.1016/S1534-0856(02)05010-7

Wade-Benzoni, K. A., & Plunkett Tost, L. (2009). The egoism and altruism of intergenerational behavior. *Personality and Social Psychology Review*, *13*(3), 165-193. https://doi.org/10.1177/1088868309339317

Wade-Benzoni, K. A., Sondak, H., & Galinsky, A. D. (2010). Leaving a legacy: Intergenerational allocations of benefits and burdens. *Business Ethics Quarterly*, *20*(1), 7-34. https://doi.org/10.5840/beq20102013

Wade-Benzoni, K. A., Tost, L. P., Hernandez, M., & Larrick, R. P. (2012). It's only a matter of time: Death, legacies, and intergenerational decisions. *Psychological Science*, *23*(7), 704-709. https://doi.org/10.1177/0956797612443967

Wade-Benzoni, K. A. (2008). Maple trees and weeping willows: The role of time, uncertainty, and affinity in intergenerational decisions. *Negotiation and Conflict Management Research*, *1*(3), 220-245. https://doi.org/10.1111/j.1750-4716.2008.00014.x

Wickersham, R. H., Zaval, L., Pachana, N. A., & Smyer, M. A. (2020). The impact of place and legacy framing on climate action: A lifespan approach. *PloS one*, *15*(2), e0228963. https://doi.org/10.1371/journal.pone.0228963

Williams, R. M. (1947). The reduction of intergroup tensions: a survey of research on problems of ethnic, racial, and religious group relations. *Social Science Research Council Bulletin*, *57*, 153.

Zagheni, E. (2011). The leverage of demographic dynamics on carbon dioxide emissions: does age structure matter? *Demography*, *48*(1), 371-399. https://doi.org/10.1007/s13524-010-0004-1

Zaval, L., Markowitz, E. M., & Weber, E. U. (2015). How will I be remembered? Conserving the environment for the sake of one's legacy. *Psychological Science*, *26*(2), 231-236. https://doi.org/10.1177/0956797614561266

Zhang, F., Schell, R., Kaufman, D., Salgado, G., & Jeremic, J. (2017, 2017//). Social Interaction Between Older Adults (80+) and Younger People During Intergenerational Digital Gameplay. Human Aspects of IT for the Aged Population. Applications, Services and Contexts, Cham.

Appendix C.A

Table C.A1

Intergenerational Contact

QN01	How much contact do you have with young people (e.g., as neighbors, as friends and family, at leisure activities)?	1 = none at all 5 = a great deal
Study 1		
To what extent do you experience the contact with young people as...		
QL01	...equal?	1 = not at all 5 = very
QL02	...voluntary?	
QL03	…intimate?	
QL04	...superficial?	
QL05	...pleasant?	
QL06	...competitive?	
QL07	…cooperative?	
Study 2		
QL01	How would you rate your contact with young people?	1 = very negative 5 = very positive

Table C.A2

Intergenerational Affinity

The following questions relate to your attitude toward and relationship with young people.		
Perspective Taking		
Please indicate the extent to which you agree with the following statements.		
PT01	It is easy for me to put myself in the shoes of young people.	1 = strongly disagree 5 = strongly agree
PT02	I can imagine how I would think or feel if I were young again.	
PT03	I can imagine the feelings and thoughts of young people.	
Perceived Oneness		
PO01	From the seven graphs, please select the one that best describes your relationship with young people.	7 pairs of increasingly overlapping circles
PO02	Please indicate the extent to which you would use the term ‘we’ to describe yourself and young people.	1 = not at all 5 = extremely
Empathic Concern		
Please describe how strongly you feel each emotion described toward young people.		
EC01	Sympathetic	1 = not at all 5 = a great deal
EC02	Moved	
EC03	Compassionate	
EC04	Tender	
EC05	Warm	
EC06	Soft-hearted	

Table C.A3

Legacy Motivation

Please indicate to what extent the following statements apply to you.

LM01	It is important to me to leave a positive legacy for young generations.	1 = not at all 5 = a great deal
LM02	It is important to me to avoid leaving a negative legacy for young generations.	
LM03	It is important for me to leave a positive mark on society.	
LM04	It is important to me to leave a good legacy for those who come after us.	

Note: only used in Study 1.

Table C.A4

Climate Protection Intentions and Behavior

The following questions are about different climate protection behaviors and whether you plan to implement them in the near future. If a question does not apply to you, e.g., because you do not have a car that you can replace, please check "not applicable". *Only in Study 1:* If you have already been performing a behavior for some time or for example have already replaced your car, please tick "I have already done this/I am already doing this".		
In the near future, are you planning to …		
CPI01	...repair broken things whenever possible instead of disposing of them and buying new ones?	*Study 1:* 1 = no, definitely not 2 = no, probably not 3 = yes, probably 4 = yes, definitely 5 = I have already done that/I am already doing this + not applicable *Study 2:* 1 = no, definitely not 5 = yes, definitely + not applicable
CPI02	...buy an electric car instead of a car with a combustion engine?	
CPI03	...give food to other people/institutions before it spoils (e.g., via food sharing initiatives)?	
CPI04	...maintain moderate room temperatures of no more than 20 °C in winter?	
CPI05	...avoid private air travel altogether?	
CPI06	...eat a vegetarian diet?	
CPI07	...refrain from using a private car?	
CPI08	...offset your carbon emissions through compensation payments to climate protection projects (e.g., via Atmosfair, myClimate or Primaklima)?	
CPI09	...use public transport or the bicycle instead of the car?	
CPI10	...switch off appliances when you are not using them instead of putting them into stand-by mode?	
CPI11	...save hot water (e.g., by taking shorter showers)?	
CPI12	...take part in climate protection activities (e.g., planting trees)?	
CPI13	...purchase green electricity?	
CPI14	...invest money in a social-ecological bank (e.g., GLS-Bank or UmweltBank)?	
CPI15	...vote for candidates or parties in an election because they are committed to strong climate protection?	
CPI16	...sign petitions in support of climate protection?	
CPI17	...take part in climate protection protests?	
CPI18	...donate to climate protection projects?	
CPI19	...not buy a company's products because you believe that this company is damaging the climate?	

CPI20	...be a member of a group whose aim is to protect the climate?

Table C.A5

Social Desirability

Please indicate to what extent the following statements apply to you.		
SD01	It has happened before that I have taken advantage of someone.	1 = doesn't apply at all 5 = applies completely
SD02	Even if I am feeling stressed, I am always friendly and polite to others.	
SD03	Sometimes I only help someone if I can expect something in return.	
SD04	In an argument, I always remain objective and stick to the facts.	
SD05	I've thrown garbage in the countryside or on the street before.	
SD06	When talking to someone, I always listen carefully to what the other person says.	

Table C.A6

Value Orientations

Please indicate the extent to which you consider the following values to be guiding principles of your life.		
SAV01	Social justice, correcting injustice, care for the weak	−1 = opposed to my values 0 = not important 1, 2 (unlabeled) 3 = important 4, 5 (unlabeled) 6 = very important 7 = of supreme importance
SAV02	Equality, equal opportunity for all	
SAV03	A world of peace, free of war and conflict	
BV01	Environmental protection and nature conservation	
BV02	Being one with nature, being part of nature	
BV03	Respect for the earth, living in harmony with other living beings	

Control Group Text

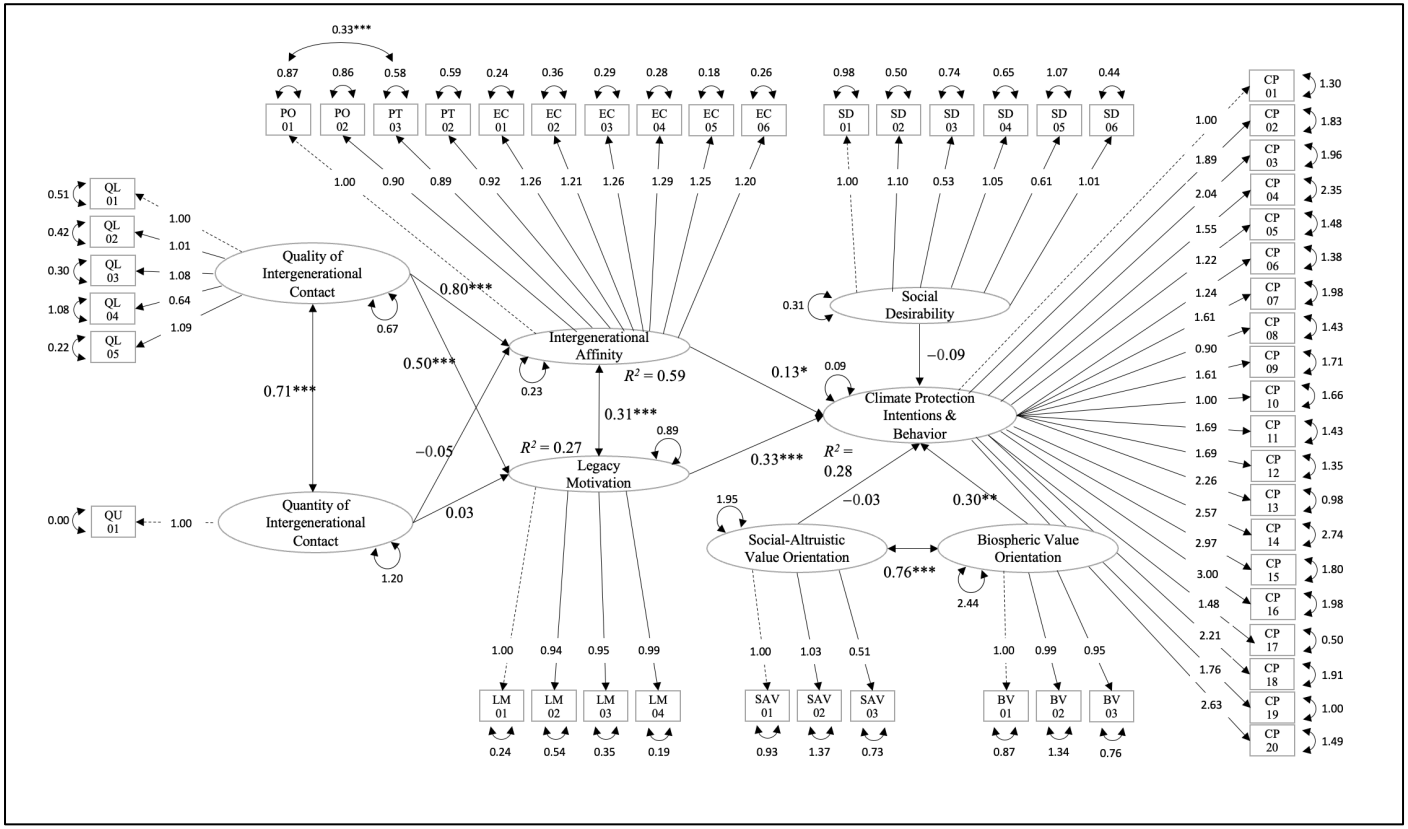
"Birgitt is 58 years old and lives with her husband and their cat in a small town in northwestern Germany. Her 30-year-old daughter lives with her husband in a big city about 200 km away. After graduating from high school, Birgitt trained as a nurse since she was interested in medicine, wanted direct contact with people and wanted to do practical work. For the past 15 years, she has worked in cardiology at the local county hospital. She has enjoyed her work all these years, however, in recent years this already not easy job has become even more stressful due to the COVID-19 pandemic. Since her husband also works shifts, they try to adjust their work schedules as much as possible. On weekends, especially now in the hot summer, they like to go to the nearby lake, where they also have an allotment. However, blue-green algae have now been found in the

lake, which means swimming is over for this year. Nevertheless, they enjoy the balmy evenings at the lakeside, and they have made friends with the other allotment garden owners over the years. Lately, Birgitt has been thinking more about what to do after she retires. It's a silver lining that she will have more time to visit her daughter then. She could also imagine traveling more, either with her husband or also with her best friend, who will retire at the same time as her. However, her best friend has had a new life partner for some time, who can be very demanding."

Appendix C.B

Figure C.A1

Structural Equation Model Predicting Climate Protection Intentions and Behaviors in Study 1



Note. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Appendix C.C

Table C.A7

Unadjusted and Covariate-Adjusted Descriptive Statistics for Perspective Taking Toward Younger People

Experimental Condition	Quality of Intergenerational Contact			Quantity of Intergenerational Contact			Perspective Taking (Unadjusted)			Perspective Taking (Adjusted)		
	N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
EG 1	102	4.04	1.00	106	3.07	1.17	106	3.73	0.91	100	3.79	0.88
EG 2	96	4.11	0.89	98	3.21	1.04	99	3.70	0.88	95	3.77	0.82
CG	100	4.00	0.86	103	3.18	1.09	103	3.68	0.84	100	3.75	0.84

Table C.A8

Analysis of Covariance for Perspective Taking Toward Younger People in Experimental Condition with Quality and Quantity of Intergenerational Contact as Covariates

Source	*SS*	*df*	*MS*	*F*	*p*	η^2
Quality of Intergenerational Contact	30.19	1	30.19	60.49	<0.001	0.17
Quantity of Intergenerational Contact	7.45	1	7.45	14.92	<0.001	0.049
Experimental Condition	0.39	2	0.20	0.39	0.68	0.00
Error	144.74	290	0.50			

Note: $R^2 = 0.32$ (*Adj.* $R^2 = 0.31$).

Table C.A9

Unadjusted and Covariate-Adjusted Descriptive Statistics for Empathic Concern for Younger People

Experimental Condition	Empathic Concern (Unadjusted)			Empathic Concern (Adjusted)		
	N	*M*	*SD*	*N*	*M*	*SD*
EG 1	107	3.55	0.83	101	3.59	0.80
EG 2	98	3.71	0.74	94	3.76	0.70
CG	103	3.55	0.80	100	3.56	0.81

Table C.A10

Analysis of Covariance for Empathic Concern for Younger People in Experimental Condition with Quality and Quantity of Intergenerational Contact as Covariates

Source	*SS*	*df*	*MS*	*F*	*p*	η^2
Quality of Intergenerational Contact	42.94	1	42.94	114.72	<0.001	0.28
Quantity of Intergenerational Contact	1.45	1	1.45	3.87	0.05	0.01
Experimental Condition	1.07	2	0.54	1.43	0.24	0.01
Error	108.55	290	0.374			

Note: $R^2 = 0.39$ (*Adj.* $R^2 = 0.38$).

Table C.A11

Unadjusted and Covariate-Adjusted Descriptive Statistics for Perceived Oneness with Younger People

Experimental Condition	Perceived Oneness (Unadjusted)			Perceived Oneness (Adjusted)		
	N	***M***	***SD***	***N***	***M***	***SD***
EG 1	105	3.08	0.94	101	3.12	0.93
EG 2	99	3.22	0.91	95	3.28	0.86
CG	103	3.10	1.01	100	3.17	0.95

Table C.A12

Analysis of Covariance for Perceived Oneness With Younger People in Experimental Condition with Quality and Quantity of Intergenerational Contact as Covariates

Source	***SS***	***df***	***MS***	***F***	***p***	η^2
Quality of Intergenerational Contact	15.86	1	15.86	26.88	<0.001	0.09
Quantity of Intergenerational Contact	23.34	1	23.34	39.57	<0.001	0.12
Experimental Condition	0.65	2	0.33	0.55	0.58	0.00
Error	171.65	291	0.59			

Note: $R^2 = 0.30$ (*Adj.* $R^2 = 0.29$).

Table C.A13

Unadjusted and Covariate-Adjusted Descriptive Statistics for Climate Protection Intentions

Experimental Condition	Climate Protection Intention (Unadjusted)			Climate Protection Intention (Adjusted)		
	N	***M***	***SD***	***N***	***M***	***SD***
EG 1	107	2.64	0.76	101	2.67	0.74
EG 2	99	2.88	0.74	95	2.90	0.75
CG	103	2.93	0.88	100	2.94	0.86

Table C.A14

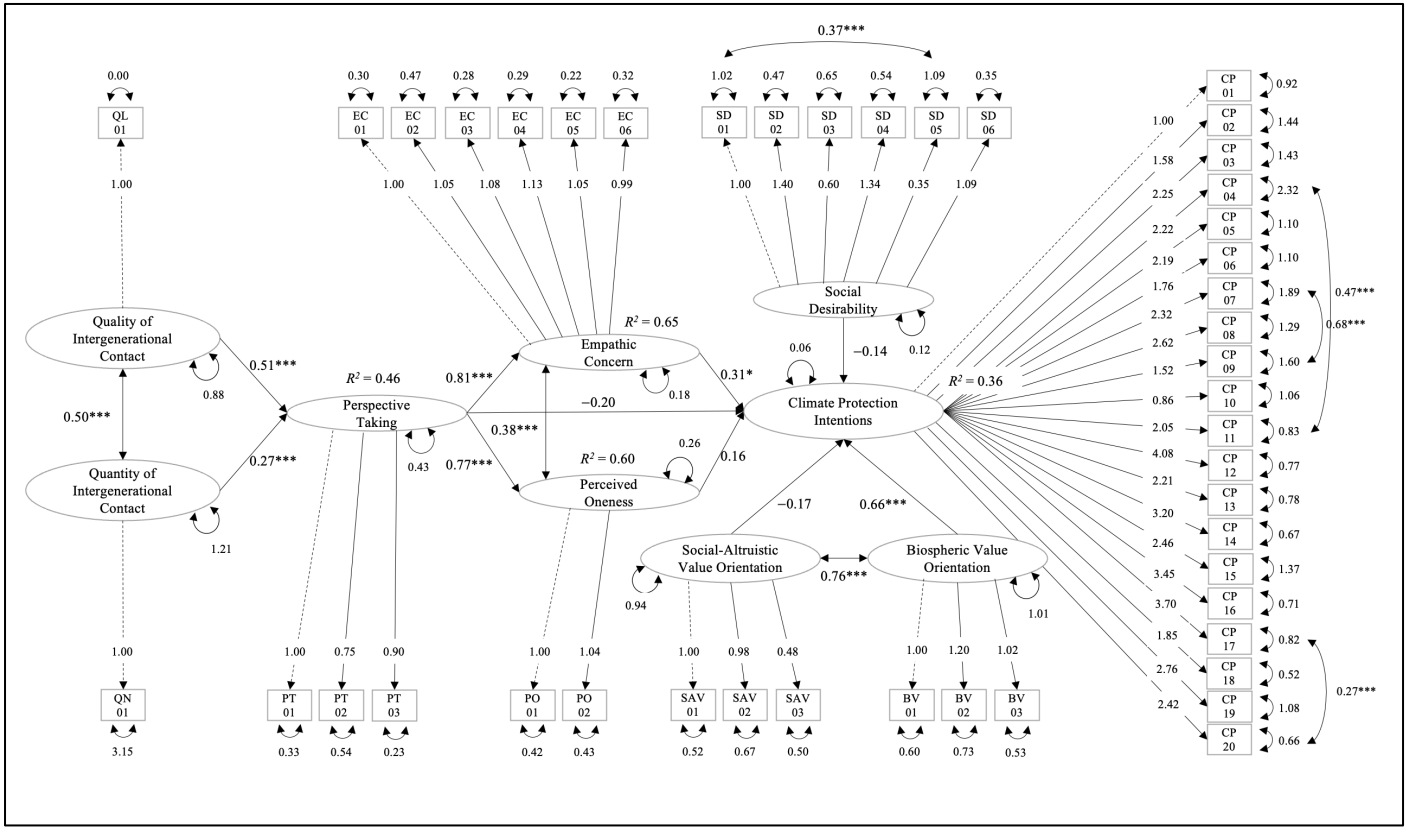
Analysis of Covariance for Climate Protection Intention in Experimental Condition with Quality and Quantity of Intergenerational Contact as Covariates

Source	***SS***	***df***	***MS***	***F***	***p***	η^2
Quality of Intergenerational Contact	3.15	1	3.15	5.20	0.23	0.02
Quantity of Intergenerational Contact	0.14	1	0.14	0.23	0.64	0.00
Experimental Condition	4.26	2	2.13	3.52	0.03	0.02
Error	176.05	291	0.61			

Note: $R^2 = 0.05$ (*Adj.* $R^2 = 0.04$).

Figure C.A2

Structural Equation Model Predicting Climate Protection Intentions in Study 2



Note. * $p < 0.05$. *** $p < 0.001$.

Additional Information on Publication C

Journal Scope

Sustainability is an international and cross-disciplinary, scholarly, open access journal of technical, environmental, cultural, economic and social sustainability of human beings, which provides an advanced forum for studies related to sustainability and sustainable development. As a peer-reviewed and semimonthly journal, Sustainability publishes reviews, regular research papers, communications, and short notes, with no restriction on the maximum length of the papers.

Our aim is to encourage researchers to publish their experimental, computational, and theoretical research relating to natural and applied sciences, engineering, economics, social sciences, and humanities in detail to promote scientific and other understanding and to permit predictions and impact assessments of global change and development related to sustainability. Knowing the importance of sustainability and achieving sustainable development for humanity, Sustainability strives to support the 2030 Agenda for Sustainable Development adopted by United Nations. As a transdisciplinary journal, Sustainability encourages researchers to provide full experimental and methodological details so that results can be reproduced and assessed. The journal supports open access and open science.

(https://www.mdpi.com/journal/sustainability/about)

Personal Contribution

Conceptualization: 85%; Methods: 85%; Formal analyses: 90%; Investigation: 90%; Data curation: 100%; Writing - 1st draft: 90%; Writing - review and editing: 85%; Visualization: 95%

5. General Discussion and Reflection

In this dissertation, I aimed at developing a model that explains macro-level intergenerational solidarity, both crisis-specific and crisis-overarching, form young to old and old to young, and in different socio-cultural contexts. Drawing on previous research on facilitators of intergroup and intergenerational prosociality, I examined the potential of intergenerational contact (Research Question 1), intergenerational closeness (Research Questions 2.1 and 2.2), and legacy motivation (Research Question 3) to predict macro-level intergenerational solidarity.

5.1 Summary and Integration of Results

5.1.1 Research Question 1: The Role of Intergenerational Contact in Predicting Intergenerational Solidarity

Research question 1 examined the role of intergenerational contact for predicting macro-level intergenerational solidarity. With regards to crisis-overarching intergenerational solidarity, the quantity and especially the quality of intergenerational contact emerged as significant predictors of older people's political solidarity in Germany, the US, and Brazil. Accordingly, with regards to crisis-specific intergenerational solidarity, the quantity and again particularly the quality of intergenerational contact emerged as significant predictors of older people's climate crisis mitigation intentions and behavior, hence their solidarity with younger people and future generations. However, the crisis-specific intergenerational solidarity of younger people with older people in the COVID-19 pandemic was not positively related to younger people's contact with older people. While contrary to expectations, this result is not surprising, as reducing one's physical contact with vulnerable others was an effective way to protect them from an infection.

Except for the results from Study 1, the results on the role of intergenerational contact are in line with a large body of findings on the beneficial role of intergroup contact for improving intergroup behaviors and promoting intergroup prosocial behaviors such as collective behaviors on behalf of other groups (Hässler et al., 2020) and outgroup helping behaviors (Johnston & Glasford, 2018). The fact that the present studies consistently showed a greater effect of contact quality than quantity is also consistent with previous findings on the dominance of contact quality (Islam & Hewstone, 1993).

Taken together, Studies 2 to 4 suggest that contact with members of another, potentially more crisis-affected, generation is positively related to solidarity behavior on behalf of the other generation, both crisis-specific and crisis-overarching, and in different socio-cultural contexts.

5.1.2 Research Question 2: The Role of Social Closeness between Generations in Predicting Intergenerational Solidarity

Research Question 2.1 examined the role of intergenerational closeness (conceptualized as intergenerational identification and intergenerational affinity) for explaining macro-level intergenerational solidarity. Research Question 2.2 examined whether intergenerational closeness mediates the relationship between intergenerational contact and intergenerational solidarity.

Regarding crisis-specific intergenerational solidarity in the COVID-19 pandemic, the social identification with another generation did not emerge as a significant predictor of intergenerational solidarity. This non-significant relationship might be due to the lack of a shared characteristic on which to base the identification (Turner, 1975). In a similar line of reasoning, Wade-Benzoni (2003) suggests that referring to "young and future generations" (instead of, e.g., future Americans) makes the group boundaries between generations more apparent and divides groups into generations.

Affinity with another generation, on the other hand, emerged as a significant predictor of both crisis-specific intergenerational solidarity (in the climate crisis) and crisis-overarching intergenerational solidarity (intergenerational political solidarity), the latter in all three countries examined. This results go in line with prior findings on the beneficial role of intergenerational affinity for intergenerational beneficence (Wade-Benzoni, 2008). The experimental manipulation of intergenerational perspective taking was not successful. Yet, intergenerational perspective taking still predicted intergenerational solidarity through empathic concern on a correlational level. This result is consistent with other findings showing that perspective taking mediated by empathy can promote prosocial behavior (Todd & Galinsky, 2014).

Furthermore, both regarding crisis-specific intergenerational solidarity in the climate crisis and crisis-overarching intergenerational political solidarity, intergenerational affinity fully mediated the relationship between intergenerational contact and intergenerational solidarity. This finding suggests that intergenerational contact can facilitate taking the perspective and emphasizing with the emotions of members of another generation, as well as fostering a sense of "we-ness", thereby promoting intergenerational solidarity. The findings on the mediating role of affinity for the relationship of contact between generations and intergenerational solidarity are in line with previous research identifying perspective taking,

empathy, and a shared social identity as important mediators for the effect of intergroup contact on intergroup attitudes and behaviors (Cadieux et al., 2019; Pettigrew & Tropp, 2008).

Taken together, findings on research question 2 suggest that the more connected people feel toward members of different generation, the more affinity they report, and the more willing they are to act on their behalf, e.g., the more willing they are to mitigate a crisis even if this mitigation behavior does not bear many personal benefits and might even come at personal costs.

5.1.3 Research Question 3: The Role of Legacy Motivation in Predicting Intergenerational Solidarity

Research question 3 examined whether legacy motivation predicts macro-level intergenerational solidarity. As legacy motivation refers to the desire to leave behind a positive legacy for young and future generations, it was only assessed and considered as a motivator for solidarity directed at young and future generations, thus in Studies 2 and 3.

Legacy motivation emerged as a significant predictor of both crisis-specific and crisis-overarching intergenerational solidarity. The higher older people's legacy motivation, the higher was their political solidarity toward younger people in all three countries examined. Accordingly, legacy motivation was positively related to older people's climate crisis mitigation intentions and behavior.

These results are in line with previous research showing a positive effect of legacy motivation on both intergenerational prosociality (Wade-Benzoni et al., 2010) as well as climate crisis mitigation behaviors (Hurlstone et al., 2020). The results suggest that appealing to someone's legacy motivation could be a powerful facilitator of solidary behavior directed at young and future generations both crisis-specific and crisis-overarching.

4.1.3 Cross-Cultural Validation of the Model

Alongside testing the model in different crises and crisis-overarching as well as in different generational directions, my research objective was also to test the model in different socio-cultural contexts. To this end, Study 2 examined all four research questions in the United States, Germany, and Brazil. As stated in the respective result sections above, intergenerational contact, intergenerational affinity, and legacy motivation explained intergenerational solidarity in all three countries, suggesting that similar mechanisms underly intergenerational solidarity in different countries. Moreover, the postulated model was measurement invariant across the countries, making cross-cultural comparisons possible in the first place (Milfont & Fischer,

2010). These results suggest that the postulated model can be applied to different socio-cultural contexts.

5.2 Limitations of the Present Dissertation

All presented studies are characterized by several limitations that are discussed in the respective sections of the studies. The following section focuses on the discussion of limitations that are relevant for the entire dissertation.

All results are correlational in nature and therefore do not allow for causal inferences. It is, for example, conceivable that the causality between the predictors of intergenerational solidarity may be reciprocal, e.g., between the variables of intergenerational affinity and intergenerational contact.

All four studies relied exclusively on online questionnaires as data collection method. Although a review by Remillard et al. (2014) showed that online questionnaires are a valid method to survey older adults in some geographic regions (e.g., developed regions) and for some subsets of older adults (e.g., among the educated), limited internet access or mental and health capacities can restrict accessibility and limit the generalizability. Accordingly, requiring internet access for study participation also may exclude other demographic groups, such as those from less educated backgrounds. This was the case in Study 2, in which I sought a sample representative for education. However, especially in Brazil, this was not achieved, as not enough Brazilians with a low level of education (no high school degree) could be reached.

Another point of criticism related to data collection is that all studies used only self-reported measures of behavior, e.g., to assess climate crisis mitigation behavior. Self-reports can be subject to bias, and sometimes show only weak relationships with, and little predictive value for, objectively measured behavior (see Koller et al., 2023 for an overview). However, self-reports are a commonly used method in Environmental Psychology, and have several practical advantages (Steg & Vlek, 2009).

Data from all four studies were of quantitative nature and hence potentially did not capture participants' lived experiences as qualitative insights might have. Preliminary qualitative interviews or focus groups could have been beneficial to explore the concept of intergenerational solidarity and its potentially different understandings across different generations, cultures, etc.

Furthermore, each study examined only one intergenerational direction, that is, from young to old or vice versa. This was decided because the declared aim of this dissertation was to study solidarity with generations more affected by a particular crisis on the part of a less

affected generation. However, a superordinate intergenerational solidarity is needed in all generational directions, and the crisis-overarching intergenerational political solidarity could have been studied in different generational directions simultaneously.

An overarching point of criticism is that I did not explicitly assess whether the behaviors assessed (especially in the two crises) were done at least in part on behalf of other generations, i.e., whether these behaviors truly represented intergenerational solidarity. I controlled for other potentially relevant motivators (not exhaustively, of course), e.g., social-altruistic and biospheric value orientations in the climate crisis, and one's own vulnerability and social-altruistic values in the COVID-19 pandemic study. The positive correlations between the intergenerational variables and the behaviors in question, after controlling for these factors, suggest that intergenerational considerations played some role in motivating these behaviors, which, at least to some extent, makes them intergenerational solidarity behaviors.

5.3 Implications for Future Research

The present dissertation was among the first to examine psychological predictors of macro-level intergenerational solidarity. However, as all findings are of a correlative nature only, future research is needed to test the causal direction of the relationships found, e.g., through experimental or longitudinal studies.

In line with previous research (Jin et al., 2021; Romano et al., 2021) that considered crisis mitigation behavior as cooperative behavior, the crisis mitigation behaviors studied (COVID-19 containment and climate crisis mitigation) were implicitly referred to as intergenerational solidarity as they support more affected generations. Future research should examine whether individuals actually perceive these and related behaviors as intergenerational solidarity by measuring the intention to support other generations through these behaviors.

In general, future studies could take a step back and qualitatively assess the understanding of intergenerational solidarity among different groups, e.g., different generations, cultures, etc. We made a first advance in Study 2 to study cultural differences in the understanding of intergenerational solidarity. We assessed the topics participants thought solidarity between generations were most relevant for via open-ended questions. Results revealed different perspectives, e.g., Brazilians indicated education to be a very relevant topic for intergenerational solidarity, whereas Germans mentioned both climate change and the pension system relatively often, and many US Americans considered intergenerational solidarity as relevant for political issues.

It is also conceivable that intergenerational solidarity differs depending on which generation one belongs to, both in what it is understood as and how it is motivated. For example, studies show that acting on behalf of younger and future generations, e.g., by transferring knowledge (McAdams & de St Aubin, 1992) becomes more relevant the older one gets (Wickersham et al., 2020). Future studies could explore the understanding of intergenerational solidarity in a variety of generations through, e.g., qualitative interviews or focus groups. Furthermore, future studies on psychological predictors of macro-level solidarity could include not only one but several generations to test the mechanisms underlying intergenerational solidarity and examine whether the model is measurement invariant across different generations.

The present dissertation delivered first insights into the promising role of intergenerational affinity for macro-level intergenerational solidarity. Future studies might more closely examine the concept of affinity itself and further examine the interrelationships of its subfacets, alongside a test of the causal effects of intergenerational affinity on intergenerational solidarity. Future studies could also apply the variable of affinity to other groups, e.g., ethnicities and interest groups, as all existing research (Wade-Benzoni, 2008) has only investigated affinity in the intergenerational context.

To my knowledge, the present dissertation was the first to examine the potential of intergenerational contact for promoting climate crisis mitigation endeavors amongst older adults. Future research could follow up on this research question and also apply it to different environmental crises.

5.4 Implications for Practice

Assuming that the causal directions of the findings are consistent with previous related research (e.g., on the causal influence of legacy motivation on intergenerational beneficence; Hurlstone et al., 2020; on the causal influence of intergroup contact on intergroup prosociality; Koschate et al., 2012; on the causal effect of intergenerational affinity on intergenerational beneficience; Wade-Benzoni, 2008), tentative potential implications for practice and learnings about how to promote intergenerational solidarity at the macro level can be derived from the results of this dissertation.

Results suggest that particularly high-quality intergenerational contact contributes to solidarity behavior on behalf of another generation. Targeting intergenerational contact has various positive implications, as 1) contact normally goes both ways, meaning both generations involved should as a result feel more connected with and willing to act on behalf of the other

generation, 2) intergenerational contact contributes to a more general social cohesion, 3) intergenerational contact can promote a plethora of desired outcomes, as it is not crisis-specific, and can for example simultaneously promote climate crisis mitigation behaviors and political solidary behaviors. As previous research and also the present studies demonstrate, the quality of the contact is more important than its quantity. When promoting intergenerational contact, one should therefore ensure it is perceived as positive by the participants. This could be achieved by adhering Allport's conditions for effective intergroup contact, i.e., equal group status within the situation, common goals, intergroup cooperation and authority support (Allport, 1954). Potential ways to increase intergenerational contact and thereby promote intergenerational solidarity are programs such as "Patengroßeltern", multigenerational housing projects, computer tutoring for seniors by teenagers, opening up university classes to older people, and mentoring programs in companies for new employees by seniors. Support from government agencies, public institutions, and businesses would be needed to plan and implement these projects.

Results furthermore indicate that increasing the affinity between different generations has the potential to promote intergenerational solidarity both crisis-specific and crisis-overarching. Especially affinity's subfacets of perspective taking and empathic concern appear to be relevant in this context. As the findings of this dissertation show, increasing the contact and in particular its quality with a different generation could be a tool for increasing people's capacity to put themselves in the shoes of members of a different generation and empathize with their emotions. Furthermore, the ability to take the perspective of another generation could be directly targeted, e.g., by increasing the representation and visibility of the life realities of members of a variety of generations. This could for example be achieved by including older characters and their stories in TV and talk shows that mainly have a younger audience. If a specific crisis mitigation behavior on behalf of more affected generations is to be targeted, a poster campaign could be used to communicate the consequences of this crisis for the more affected generation, e.g., showing the projected temperature increase due to the climate crisis and the positioning of future generations in this scenario.

Results suggest that appealing to older people's desire to leave behind a positive legacy can be a powerful tool for promoting both overarching and crisis-specific intergenerational solidarity. This could be achieved by encouraging people to consider that their descendants and future others will be alive in the future to experience the consequences of their behavior. One potential way to appeal to people's legacy motivation could be for example using a slogan such

as “What kind of world do you want to leave behind for them?” accompanied by the image of young children in climate crisis mitigation campaigns. One campaign that already exists is the initiative “Testamentsspende – Für immer aktiv” (will donation – forever active) from Greenpeace (Greenpeace, 2024). They appeal to people’s legacy motivation by offering them to make a difference and have their money work for the planet and other people beyond their lifespan by donating a part of their inheritance to Greenpeace. Legacy motivation is closely related to the concept of generativity, which includes, alongside leaving a positive legacy, e.g., the transfer of knowledge and skills to younger generations (Erikson, 1963). It is therefore conceivable that encouraging the transfer of knowledge from older to younger people, e.g. through mentoring programs, could appeal to the legacy motivation of older people.

5.5 Conclusion

Many of the large-scale crises facing societies affect different generations to different extents, and more vulnerable generations often require the solidarity of less affected generations. It is important that members from all generations contribute to mitigate the specific crises, e.g., to protect the climate. However, the present dissertation focused on factors that might motivate generations who themselves are or will be less affected by these crises and therefore have less self-interest in mitigating them.

The present dissertation developed a model to explain the much-needed intergenerational solidarity at a macro level through psychological variables that have in the past successfully explained intergroup and intergenerational prosociality. The findings suggest that even without targeting a specific crisis, reducing the psychological distance between generations, e.g., through high-quality contact, affinity, and legacy motivation, has the potential to increase intergenerational solidarity both in general, thus crisis-overarching, and in specific large-scale crises. It is conceivable that these mechanisms could also be applied to other crises with intergenerational dynamics, such as nature conservation. As these results were found in a variety of socio-cultural settings, it can furthermore be assumed that the implications can be generalized beyond WEIRD countries and samples.

References

Aberson, C. L., & Haag, S. C. (2007). Contact, perspective taking, and anxiety as predictors of stereotype endorsement, explicit attitudes, and implicit attitudes. *Group Processes & Intergroup Relations*, *10*(2), 179-201. https://doi.org/10.1177/1368430207074726

Ahn, S. J., Le, A. M. T., & Bailenson, J. (2013). The effect of embodied experiences on self-other merging, attitude, and helping behavior. *Media Psychology*, *16*(1), 7-38. https://doi.org/10.1080/15213269.2012.755877

Allport, G. W. (1954). *The Nature of Prejudice*. Addison Wesley.

Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, *63*(4), 596. https://doi.org/10.1037/0022-3514.63.4.596

Bang, H. M., Koval, C. Z., & Wade-Benzoni, K. A. (2017). It's the thought that counts over time: The interplay of intent, outcome, stewardship, and legacy motivations in intergenerational reciprocity. *Journal of Experimental Social Psychology*, *73*, 197-210. https://doi.org/10.1016/j.jesp.2017.07.006

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology 51*(6), 1173-1182.

Batson, C. D. (1987). Prosocial motivation: Is it ever truly altruistic? *Advances in Experimental Social Psychology*, *20*, 65-122. https://doi.org/10.1016/S0065-2601(08)60412-8

Batson, C. D. (1994). Why Act for the Public Good? Four Answers. *Personality and Social Psychology Bulletin*, *20*(5), 603-610. https://doi.org/10.1177/0146167294205016

Batson, C. D., & Ahmad, N. Y. (2009). Using empathy to improve intergroup attitudes and relations. *Social Issues and Policy Review*, *3*(1), 141-177. https://doi.org/10.1111/j.1751-2409.2009.01013.x

Batson, C. D., Chang, J., Orr, R., & Rowland, J. (2002). Empathy, attitudes, and action: Can feeling for a member of a stigmatized group motivate one to help the group? *Personality and Social Psychology Bulletin*, *28*(12), 1656-1666. https://doi.org/10.1177/014616702237647

Batson, C. D., Early, S., & Salvarani, G. (1997a). Perspective Taking: Imagining How Another Feels Versus Imaging How You Would Feel. *Personality and Social Psychology Bulletin*, *23*(7), 751-758. https://doi.org/10.1177/0146167297237008

Batson, C. D., Lishner, D. A., & Stocks, E. L. (2015). The Empathy—Altruism Hypothesis. In D. A. Schroeder & W. G. Graziano (Eds.), *The Oxford handbook of prosocial behavior* (pp. 259–281). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780195399813.013.023

Batson, C. D., Polycarpou, M. P., Harmon-Jones, E., Imhoff, H. J., Mitchener, E. C., Bednar, L. L., Klein, T. R., & Highberger, L. (1997b). Empathy and attitudes: Can feeling for a member of a stigmatized group improve feelings toward the group? *Journal of Personality and Social Psychology*, *72*(1), 105. https://doi.org/10.1037/0022-3514.72.1.105

Batson, C. D., Sager, K., Garst, E., Kang, M., Rubchinsky, K., & Dawson, K. (1997c). Is empathy-induced helping due to self–other merging? *Journal of Personality and Social Psychology*, *73*(3), 495. https://doi.org/10.1037/0022-3514.73.3.495

Batson, C. D., Sager, K., Garst, E., Kang, M., Rubchinsky, K., & Dawson, K. (1997d). Is Empathy-Induced Helping Due to Self–Other Merging? *Journal of Personality and Social Psychology*, *73*, 495-509. https://doi.org/10.1037/0022-3514.73.3.495

Bengtson, V., Olander, E., & Haddad, A. (1976). The “Generation Gap" and Aging Family Members: Toward a Conceptual Model. In J. F. Gubrium (Ed.), *Time, Roles, and the Self in Old Age* (pp. 237-263). Hamn Sciences Press.

Bengtson, V. L., & Oyama, P. S. (2010). Intergenerational Solidarity and Conflict. In M. A. Cruz-Saco & S. Zelenev (Eds.), *Intergenerational Solidarity* (pp. 32-52).

Bengtson, V. L., & Robert, E. L. R. (1991). Intergenerational Solidarity in Aging Families: An Example of Formal Theory Construction. *Journal of Marriage and Family*, *53*(4), 856-870. https://doi.org/10.2307/352993

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*(3), 588. https://doi.org/10.1037/0033-2909.88.3.588

Betsch, C., Wieler, L., Bosnjak, M., Ramharter, M., Stollorz, V., Omer, S., Korn, L., Sprengholz, P., Felgendreff, L., & Eitze, S. (2020). *Germany COVID-19 Snapshot Monitoring (COSMO Germany): Monitoring knowledge, risk perceptions, preventive behaviours, and public trust in the current coronavirus outbreak in Germany*. PsychArchives.

Bierhoff, H. W., & Küpper, B. (1999). Social Psychology of Solidarity. In K. Bayertz (Ed.), *Solidarity* (pp. 133-156). Springer Netherlands. https://doi.org/10.1007/978-94-015-9245-1_7

Borsboom, D. (2006). When does measurement invariance matter? *Medical Care*, *44*(11), S176-S181. https://doi.org/10.1097/01.mlr.0000245143.08679.cc

Bousfield, C., & Hutchison, P. (2010). Contact, anxiety, and young people's attitudes and behavioral intentions towards the elderly. *Educational Gerontology*, *36*(6), 451-466. https://doi.org/10.1080/03601270903324362

Brown, R., Eller, A., Leeds, S., & Stace, K. (2007). Intergroup contact and intergroup attitudes: A longitudinal study. *European Journal of Social Psychology*, *37*(4), 692-703. https://doi.org/10.1002/ejsp.384

Brundtland, G. H. (1987). *Our Common Future: Report of the World Commission on Environment and Development*.

Cadieux, J. (2018). Intergenerational Contact Predicts Attitudes Toward Older

Adults Through Inclusion of the Outgroup in the Self. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 575-584. https://doi.org/10.1093/geronb/gbx176

Cadieux, J., Chasteen, A. L., & Packer, P., Dominic J. (2019). Intergenerational contact predicts attitudes toward older adults through inclusion of the outgroup in the self. *The Journals of Gerontology: Series B*, *74*(4), 575-584. https://doi.org/https://doi.org/10.1093/geronb/gbx176

Cameron, J. E. (2004). A three-factor model of social identity. *Self and Identity 3*(3), 239-262. https://doi.org/10.1080/13576500444000047

Cameron, L. D., Brown, P. M., & Chapman, J. G. (1998). Social value orientations and decisions to take proenvironmental action. *Journal of Applied Social Psychology*, *28*(8), 675-697. https://doi.org/10.1111/j.1559-1816.1998.tb01726.x

Chen, F. F. (2007). Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, *14*(3), 464-504. https://doi.org/10.1080/10705510701301834

Cialdini, R. B., Brown, S. L., Lewis, B. P., Luce, C., & Neuberg, S. L. (1997). Reinterpreting the empathy–altruism relationship: When one into one equals oneness. *Journal of Personality and Social Psychology*, *73*(3), 481-494. https://doi.org/10.1037/0022-3514.73.3.481

Coke, J. S., Batson, C. D., & McDavis, K. (1978). Empathic mediation of helping: a two-stage model. *Journal of Personality and Social Psychology*, *36*(7), 752-766. https://doi.org/10.1037/0022-3514.36.7.752

Crowne, D. P., & Marlowe, D. (1964). *The approval motive: Studies in evaluative dependence*. New York: Wiley.

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology*, 1-19.

Davis, M. H. (1983). Measuring individual differences in empathy: evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, *44*(1), 113.

Davis, M. H., Luce, C., & Kraus, S. J. (1994). The heritability of characteristics associated with dispositional empathy. *Journal of Personality*, *62*(3), 369-391. https://doi.org/10.1111/j.1467-6494.1994.tb00302.x

De Coninck, D., Rodríguez-de-Dios, I., & d'Haenens, L. (2021). The contact hypothesis during the European refugee crisis: Relating quality and quantity of (in) direct intergroup contact to attitudes towards refugees. *Group Processes & Intergroup Relations*, *24*(6), 881-901. https://doi.org/10.1177/1368430220929394

De Groot, J. I., & Steg, L. (2009). Morality and prosocial behavior: The role of awareness, responsibility, and norms in the norm activation model. *The Journal of Social Psychology 149*(4), 425-449. https://doi.org/10.3200/SOCP.149.4.425-449

de Groot, J. I. M., & Steg, L. (2008). Value Orientations to Explain Beliefs Related to Environmental Significant Behavior:How to Measure Egoistic, Altruistic, and Biospheric Value Orientations. *Environment and Behavior*, *40*(3), 330-354. https://doi.org/10.1177/0013916506297831

de Paula Sieverding, T., Merten, M., & Kastner, K. (2023). Old for young: Cross-national examination of intergenerational political solidarity. *Group Processes & Intergroup Relations*, 13684302231201785. https://doi.org/10.1177/13684302231201785

Dovidio, J. F., Gaertner, S. L., Schnabel, N., Saguy, T., & Johnson, J. (2010). Recategorization and prosocial behavior. In S. Stürmer & M. Snyder (Eds.), *The Psychology of Prosocial Behavior: Group Processes, Intergroup Relations, and Helping* (pp. 289-309). Wiley-Blackwell.

Drury, L., Hutchison, P., & Abrams, D. (2016). Direct and extended intergenerational contact and young people's attitudes towards older adults. *British Journal of Social Psychology*, *55*(3), 522-543. https://doi.org/10.1111/bjso.12146

Eisenberg, N., & Miller, P. A. (1987). The relation of empathy to prosocial and related behaviors. *Psychological Bulletin*, *101*(1), 91-119. https://doi.org/10.1037/0033-2909.101.1.91

Elliott, R. (2022). The 'Boomer remover': Intergenerational discounting, the coronavirus and climate change. *The Sociological Review*, *70*(1), 74-91. https://doi.org/10.1177/00380261211049023

Erikson, E. H. (1963). *Childhood and Society*. Norton.

Eurofound. (2020). Living, working and COVID-19. In *COVID-19 series*. Publications Office of the European Union, Luxembourg: Eurofound.

Fairbrother, M., Arrhenius, G., Bykvist, K., & Campbell, T. (2020). How Much Do We Value Future Generations? Climate Change, Debt, and Attitudes towards Policies for Improving Future Lives. *The Institute for Futures Studies*, *11*, 237-262.

Fiedler, S., Glöckner, A., & Hellmann, M. (2021). Altruistic giving towards refugees: Identifying factors that increase citizens' willingness to help. *Frontiers in Psychology*, 1-20. https://doi.org/10.3389/fpsyg.2021.689184

Fischer, R., & Karl, J. A. (2019). A primer to (cross-cultural) multi-group invariance testing possibilities in R. *Frontiers in Psychology*, 1507. https://doi.org/10.3389/fpsyg.2019.01507

Fritsche, I., Barth, M., Jugert, P., Masson, T., & Reese, G. (2018). A social identity model of pro-environmental action (SIMPEA). *Psychological Review*, *125*(2), 245–269. https://doi.org/10.1037/rev0000090

Frumkin, H., Fried, L., & Moody, R. (2012). Aging, climate change, and legacy thinking. *Am J Public Health*, *102*(8), 1434-1438. https://doi.org/10.2105/ajph.2012.300663

Führer, S. (2021). *Solidarität in Corona-Zeiten*

Niemand ist sicher, solange nicht alle sicher sind. Retrieved 05-20-2024 from https://www.deutschlandfunkkultur.de/solidaritaet-in-corona-zeiten-niemand-ist-sicher-solange-100.html

Furuse, Y., Sando, E., Tsuchiya, N., Miyahara, R., Yasuda, I., Ko, Y. K., Saito, M., Morimoto, K., Imamura, T., & Shobugawa, Y. (2020). Clusters of coronavirus disease in communities, Japan, January–April 2020. *Emerging Infectious Diseases 26*(9), 2176–2179. https://doi.org/10.3201/eid2609.202272

Gaertner, S. L., & Dovidio, J. F. (2014). *Reducing Intergroup Bias: The Common Ingroup Identity Model*. Routledge.

Galinsky, A. D., & Moskowitz, G. B. (2000). Perspective-taking: decreasing stereotype expression, stereotype accessibility, and in-group favoritism. *Journal of Personality and Social Psychology*, *78*(4), 708-724. https://doi.org/10.1037/0022-3514.78.4.708

Geyer, S. (2021). *Steinmeier spricht mit Klimaaktivisten – und mahnt Ältere zu Solidarität*. Retrieved 05-20-2024 from https://www.rnd.de/politik/steinmeier-spricht-mit-klimaaktivisten-und-mahnt-aeltere-zu-solidaritaet-O3J52LCPVNGQBF4THV2MKBW7WI.html

Glasford, D. E. (2013). Seeing is believing: communication modality, anger, and support for action on behalf of out-groups. *Journal of Applied Social Psychology*, *43*(11), 2223-2230. https://doi.org/10.1111/jasp.12173

Greenpeace. (2024). *Testamentsspende - Für immer aktiv*. https://www.greenpeace.de/spenden/testamentsspende

Hale, N. M. (1998). Effects of Age and Interpersonal Contact on Stereotyping of the Elderly. *Current Psychology*, *17*, 28-38. https://doi.org/10.1007/s12144-998-1019-2

Hartmann, C. (2021). *Young people, climate change and political power: comparing Germany and the UK*. Retrieved 03-24-2023 from https://www.if.org.uk/2021/09/02/young-people-climate-change-and-political-power-comparing-germany-and-the-uk/

Hässler, T., Ullrich, J., Bernardino, M., Shnabel, N., Laar, C. V., Valdenegro, D., Sebben, S., Tropp, L. R., Visintin, E. P., & González, R. (2020). A large-scale test of the link between intergroup contact and support for social change. *Nature Human Behaviour*, *4*(4), 380-386. https://doi.org/10.1038/s41562-019-0815-z

Hellmann, D. M., Dorrough, A., & Glöckner, A. (2021). Prosocial behavior during the COVID-19 pandemic in Germany. The role of responsibility and vulnerability. *Heliyon*, e08041. https://doi.org/10.1016/j.heliyon.2021.e08041

Hilbig, B. E., Glöckner, A., & Zettler, I. (2014). Personality and prosocial behavior: linking basic traits and social value orientations. *Journal of Personality and Social Psychology*, *107*(3), 529. https://doi.org/10.1037/a0036074

Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal 6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Hurlstone, M. J., Price, A., Wang, S., Leviston, Z., & Walker, I. (2020). Activating the legacy motive mitigates intergenerational discounting in the climate game. *Global Environmental Change*, *60*, 102008. https://doi.org/10.1016/j.gloenvcha.2019.102008

IPCC. (2022). *Summary for Policymakers. Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (9291691593).

IPCC. (2023a). *FAQ 3: How will climate change affect the lives of today's children tomorrow, if no immediate action is taken?* Retrieved 02-01-2024 from https://www.ipcc.ch/report/ar6/wg2/about/frequently-asked-questions/keyfaq3/

IPCC. (2023b). *Longer Report. Synthesis Report of the IPCC Sixth Assessment Report*.

Islam, M. R., & Hewstone, M. (1993). Dimensions of contact as predictors of intergroup anxiety, perceived out-group variability, and out-group attitude: An integrative model. *Personality and Social Psychology Bulletin*, *19*(6), 700-710. https://doi.org/10.1177/0146167293196005

Jang, H. (2022). Perspective-taking of a similarly-situated single victim increases donations for multiple victims. *Journal of Philanthropy and Marketing*, *27*(4), e1743. https://doi.org/10.1002/nvsm.1743

Jin, S., Balliet, D., Romano, A., Spadaro, G., Van Lissa, C. J., Agostini, M., Bélanger, J. J., Gützkow, B., Kreienkamp, J., & Leander, N. P. (2021). Intergenerational conflicts of interest and prosocial behavior during the COVID-19 pandemic. *Personality and Individual Differences*, *171*, 1-8. https://doi.org/10.1016/j.paid.2020.110535

John, A., & R., P. (1994). An Overlapping Generations Model of Growth and the Environment. In R. P. A. John (Ed.), *Distributional Effects of Environmental and Energy Policy* (Vol. 104, pp. 1393-1410).

Johnson, T. P., & Van de Vijver, F. J. (2003). Social desirability in cross-cultural research. In J. A. Harkness, F. J. R. v. d. Vijver, & P. P. Mohler (Eds.), *Cross-Cultural Survey Methods* (Vol. 325, pp. 195-204).

Johnston, B. M., & Glasford, D. E. (2018). Intergroup contact and helping: How quality contact and empathy shape outgroup helping. *Group Processes & Intergroup Relations*, *21*(8), 1185-1201. https://doi.org/10.1177/136843021771177

Jordan, J. J., Yoeli, E., & Rand, D. G. (2021). Don't get it or don't spread it: Comparing self-interested versus prosocial motivations for COVID-19 prevention behaviors. *Scientific Reports 11*(1), 1-17. https://doi.org/10.1038/s41598-021-97617-5

Kappes, A., Nussberger, A.-M., Faber, N. S., Kahane, G., Savulescu, J., & Crockett, M. J. (2018). Uncertainty about the impact of social decisions increases prosocial behaviour. *Nature Human Behaviour 2*(8), 573-580. https://doi.org/10.1038/s41562-018-0372-x

Kastner, K. (2021). *Solidarische Lebensqualität - Zum psychologischen Verständnis von Solidarität und ihrer Rolle für Transformationsengagement und Lebensqualität* [Doctoral Dissertation, Otto-von-Guericke-Universität Magdeburg]. Open Access und Forschungsdaten-Repositorium der Hochschulbibliotheken in Sachsen-Anhalt. https://repo.bibliothek.uni-halle.de/handle/1981185920/66215

Kemper, C. J., Beierlein, C., Bensch, D., Kovaleva, A., & Rammstedt, B. (2012). Eine Kurzskala zur Erfassung des Gamma-Faktors sozial erwünschten Antwortverhaltens: Die Kurzskala Soziale Erwünschtheit-Gamma (KSE-G). In: GESIS – Leibniz-Institut für Sozialwissenschaften.

Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling* (3rd ed.). Guilford Press.

Klöckner, C. A. (2013). A comprehensive model of the psychology of environmental behaviour—A meta-analysis. *Global Environmental Change 23*(5), 1028-1038. https://doi.org/10.1016/j.gloenvcha.2013.05.014

Koller, K., Pankowska, P. K., & Brick, C. (2023). Identifying bias in self-reported pro-environmental behavior. *Current Research in Ecological and Social Psychology*, *4*, 100087. https://doi.org/10.1016/j.cresp.2022.100087

Koschate, M., Oethinger, S., Kuchenbrandt, D., & Van Dick, R. (2012). Is an outgroup member in need a friend indeed? Personal and task-oriented contact as predictors of intergroup prosocial behavior. *European Journal of Social Psychology*, *42*(6), 717-728. https://doi.org/10.1002/ejsp.1879

Kwong, A. N., & Yan, E. C. (2021). The Role of Quality of Face-to-face Intergenerational Contact in Reducing Ageism: The Perspectives of Young People. *Journal of Intergenerational Relationships*, *21*(1), 136–151. https://doi.org/10.1080/15350770.2021.1952134

Levine, M., Prosser, A., Evans, D., & Reicher, S. (2005). Identity and Emergency Intervention: How Social Group Membership and Inclusiveness of Group Boundaries Shape Helping Behavior. *Personality and Social Psychology Bulletin*, *31*(4), 443-453. https://doi.org/10.1177/0146167204271651

Levy, S. R. (2018). Toward reducing ageism: PEACE (positive education about aging and contact experiences) model. *The Gerontologist*, *58*(2), 226-232. https://doi.org/10.1093/geront/gnw116

Lolliot, S., Fell, B., Schmid, K., Wölfer, R., Swart, H., Voci, A., Christ, O., New, R., & Hewstone, M. (2015). Measures of intergroup contact. *Measures of Personality and Social Psychological Constructs*, 652-683. https://doi.org/10.1016/B978-0-12-386915-9.00023-1

Lytle, A., Apriceno, M., Macdonald, J., Monahan, C., & Levy, S. R. (2020). Pre-pandemic Ageism Toward Older Adults Predicts Behavioral Intentions During the COVID-19 Pandemic. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, e11-e15. https://doi.org/10.1093/geronb/gbaa210

Mace, R. A., Mattos, M. K., & Vranceanu, A. M. (2022). Older adults can use technology: why healthcare professionals must overcome ageism in digital health. *Transl Behav Med*, *12*(12), 1102-1105. https://doi.org/10.1093/tbm/ibac070

Maner, J. K., Luce, C. L., Neuberg, S. L., Cialdini, R. B., Brown, S., & Sagarin, B. J. (2002). The effects of perspective taking on motivations for helping: Still no evidence for altruism. *Personality and Social Psychology Bulletin*, *28*(11), 1601-1610. https://doi.org/10.1177/014616702237586

Mashuri, A., Zaduqisti, E., & Supriyono, Y. (2013). Perspective-taking and outgroup helping: The moderating role of warmth impression and outgroup status. *International Journal of Research Studies in Psychology*, *1*(3).

Matthies, E., de Paula Sieverding, T., Engel, L., & Blöbaum, A. (2023). Simple and Smart: Investigating Two Heuristics That Guide the Intention to Engage in Different Climate-Change-Mitigation Behaviors. *Sustainability*, *15*(9), 7156. https://doi.org/10.3390/su15097156

McAdams, D. P., & de St Aubin, E. (1992). A theory of generativity and its assessment through self-report, behavioral acts, and narrative themes in autobiography. *Journal of Personality and Social Psychology*, *62*(6), 1003.

McQuilkin, J. (2018). Doing Justice to the Future: A global index of intergenerational solidarity derived from national statistics. *Intergenerational Justice Review*, *4*(1), 4-21. https://doi.org/10.24357/igjr.12.1.639

Meshel, D. S., & McGlynn, R. P. (2004). Intergenerational contact, attitudes, and stereotypes of adolescents and older people. *Educational Gerontology*, *30*(6), 457-479. https://doi.org/10.1080/03601270490445078

Milfont, T. L., & Fischer, R. (2010). Testing measurement invariance across groups: Applications in cross-cultural research. *International Journal of Psychological Research 3*(1), 111-130. https://doi.org/10.21500/20112084.857

National Center for Education Statistics. (2021). *Number of persons age 18 and over, by highest level of educational attainment, sex, race/ethnicity, and age: 2021*. Retrieved 03-01-2023 from https://nces.ed.gov/programs/digest/d21/tables/dt21_104.30.asp?current=yes

Nelson, T. D. (2016). The age of ageism. *Journal of Social Issues 72*(1), 191-198. https://doi.org/10.1111/josi.12162

Neufeld, K. H., Gaucher, D., Starzyk, K. B., & Boese, G. D. (2019a). How feeling connected to one's own community can increase support for addressing injustice impacting outgroup communities. *Group Processes & Intergroup Relations*, *22*(4), 530-548. https://doi.org/10.1177/1368430217749881

Neufeld, K. H. S., Starzyk, K. B., & Gaucher, D. (2019b). Political solidarity: A theory and a measure. *Journal of Social and Political Psychology*, *7*(2), 726-765. https://doi.org/10.5964/jspp.v7i2.1058

OECD. (2022). *Brazil*. OECD Publishing. https://doi.org/10.1787/a5ee2d75-en

Ortiz-Riomalo, J. F., Koessler, A.-K., & Engel, S. (2021). Inducing perspective-taking for prosocial behaviour in natural resource management. *Journal of Environmental Economics and Management*, *110*, 102513. https://doi.org/10.1016/j.jeem.2021.102513

Oswald, P. A. (1996). The effects of cognitive and affective perspective taking on empathic concern and altruistic helping. *The Journal of Social Psychology*, *136*(5), 613-623. https://doi.org/10.1080/00224545.1996.9714045

Otten, S., & Moskowitz, G. B. (2000). Evidence for Implicit Evaluative In-Group Bias: Affect-Biased Spontaneous Trait Inference in a Minimal Group Paradigm. *Journal of Experimental Social Psychology*, *36*(1), 77-89. https://doi.org/10.1006/jesp.1999.1399

Pagotto, L. (2010). *The interplay of empathy, oneness and perceived similarity in mediating the effects of perspective taking on prosocial responses* (Publication Number 146905452) [Doctoral Dissertation, Università di Padova]. Semantic Scholar. https://www.semanticscholar.org/paper/The-interplay-of-empathy%2C-oneness-and-perceived-in-Pagotto/b7c380cc00760fc5451475d3dfa59161d13cbf43

Paulhus, D. L. (2017). Socially desirable responding on self-reports. In D. L. Paulhus (Ed.), *Encyclopedia of Personality and Individual Differences* (pp. 1-5): Springer.

Pettigrew, T. F., & Tropp, L. R. (2006a). A meta-analytic test of intergroup contact theory. *Journal of Personality and Social Psychology 90*(5), 751–783. https://doi.org/10.1037/0022-3514.90.5.751

Pettigrew, T. F., & Tropp, L. R. (2006b). A Meta-Analytic Test of Intergroup Contact Theory. *Journal of personality and social psychology*, *90*(5), 751–783.

Pettigrew, T. F., & Tropp, L. R. (2008). How does intergroup contact reduce prejudice? Meta-analytic tests of three mediators. *European Journal of Social Psychology*, *38*(6), 922-934. https://doi.org/10.1002/ejsp.504

Pfattheicher, S., Nockur, L., Böhm, R., Sassenrath, C., & Petersen, M. B. (2020). The emotional path to action: Empathy promotes physical distancing and wearing of face masks during the COVID-19 pandemic. *Psychological Science*, *31*(11), 1363-1373. https://doi.org/10.1177/095679762096442

Piston, S. C. (2014). *Sympathy for the Poor, Resentment of the Rich, and their Political Consequences* [Doctoral dissertation, University of Michigan]. Ann Arbor, Michigan.

Radic, A., Koo, B., Gil-Cordero, E., Cabrera-Sánchez, J. P., & Han, H. (2021). Intention to Take COVID-19 Vaccine as a Precondition for International Travel: Application of

Extended Norm-Activation Model. *International Journal of Environmental Research and Public Health*, *18*(6), 3104. https://doi.org/10.3390/ijerph18063104

Remillard, M. L., Mazor, K. M., Cutrona, S. L., Gurwitz, J. H., & Tjia, J. (2014). Systematic Review of the Use of Online Questionnaires of Older Adults. *Journal of the American Geriatrics Society*, *62*(4), 696-705. https://doi.org/10.1111/jgs.12747

Renner, R. (2021). *Millennials and Gen Z are spreading coronavirus—but not because of parties and bars*. National Geographic. Retrieved 11-04-2020 from https://www.nationalgeographic.com/science/article/millennials-generation-z-coronavirus-scapegoating-beach-parties-bars-inequality-cvd

Ritchie, H., & Roser, M. (2019). *Age Structure*. Retrieved 12-07-2023 from https://ourworldindata.org/age-structure

Robert Koch Institut. (2021a). *Epidemiologischer Steckbrief zu SARS-CoV-2 und COVID-19*. Robert Koch Institut. Retrieved 11-04-2021 from https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Steckbrief.html;jsessionid=B28C5192FA617141C410AD4115494550.internet092?nn=13490888#doc13776792bodyText15

Robert Koch Institut. (2021b). *Täglicher Lagebericht des RKI zur Coronavirus-Krankheit-2019 (COVID-19)* Retrieved 02-09-2022 from https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Situationsberichte/Gesamt.html

Robert Koch Institut. (2021c). *Wirksamkeit*. Retrieved 11-08-2021 from https://www.rki.de/SharedDocs/FAQ/COVID-Impfen/FAQ_Liste_Wirksamkeit.html

Robert Koch Institut. (2022). *Impfquotenmonitoring* https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Daten/Impfquotenmonitoring.html

Romano, A., Spadaro, G., Balliet, D., Joireman, J., Van Lissa, C., Jin, S., Agostini, M., Bélanger, J. J., Gützkow, B., & Kreienkamp, J. (2021). Cooperation and trust across societies during the COVID-19 pandemic. *Journal of Cross-Cultural Psychology*, *52*(7), 623-642. https://doi.org/10.1177/00220221209889913

Römpke, A. K., Fritsche, I., & Reese, G. (2019). Get together, feel together, act together: International personal contact increases identification with humanity and global collective action. *Journal of Theoretical Social Psychology*, *3*(1), 35-48. https://doi.org/10.1002/jts5.34

Rosman, T., Adler, K., Barbian, L., Blume, V., Burczeck, B., Cordes, V., Derman, D., Dertli, S., Glas, H., & Heinen, V. (2021). Protect ya Grandma! The Effects of Students' Epistemic Beliefs and Prosocial Values on COVID-19 Vaccination Intentions. *Frontiers in Psychology*, *12*, 1-11. https://doi.org/10.3389/fpsyg.2021.683987

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling and more. Version 0.5–12 (BETA). *Journal of Statistical Software 48*(2), 1-36

Rudert, S. C., & Janke, S. (2021). Following the crowd in times of crisis: Descriptive norms predict physical distancing, stockpiling, and prosocial behavior during the COVID-19 pandemic. *Group Processes & Intergroup Relations*, 1-17. https://doi.org/10.1177/13684302211023562

Ryder, N. B. (1965). The Cohort as a Concept in the Study of Social Change. *American Sociological Review*, 43-61.

Sánchez, M., Sáez, J., & Pinazo, S. (2010). Intergenerational Solidarity. In M. A. Cruz-Saco & S. Zelenev (Eds.), *Intergenerational Solidarity* (pp. 129-146). Springer.

Schmitt, E., Hinner, J., & Kruse, A. (2011). Dialogue between generations–basic ideas, implementation and evaluation of a strategy to increase generativity in post-soviet

societies. *Procedia-Social and Behavioral Sciences*, *12*, 300-310. https://doi.org/10.1016/j.sbspro.2011.02.039

Schwartz, L. K., & Simmons, J. P. (2001). Contact quality and attitudes toward the elderly. *Educational Gerontology*, *27*(2), 127-137. https://doi.org/10.1080/03601270151075525

Schwartz, S. H. (1977). Normative influences on altruism. *Advances in Experimental Social Psychology 10*, 221-279. https://doi.org/10.1016/S0065-2601(08)60358-5

Schwartz, S. H., & Fleishman, J. A. (1982). Effects of negative personal norms on helping behavior. *Personality and Social Psychology Bulletin*, *8*(1), 81-86. https://doi.org/10.1177/014616728281013

Schwartz, S. H., & Howard, J. A. (1981). A normative decision-making model of altruism. In J. P. Rushton & R. M. Sorrentino (Eds.), *Altruism and Helping Behavior* (pp. 89-211). Erlbaum.

Shahen, M. E., Kotani, K., & Saijo, T. (2021). Intergenerational sustainability is enhanced by taking the perspective of future generations. *Scientific Reports*, *11*(1), 1-11. https://doi.org/10.1038/s41598-021-81835-y

Shnabel, N., Dovidio, J. F., & Levin, Z. (2016). But it's my right! Framing effects on support for empowering policies. *Journal of Experimental Social Psychology*, *63*, 36-49. https://doi.org/10.1016/j.jesp.2015.11.007

Shrum, T. R., Platt, N. S., Markowitz, E., & Syropoulos, S. (2023). A scoping review of the green parenthood effect on environmental and climate engagement. *Wiley Interdisciplinary Reviews: Climate Change*, *14*(2), e818. https://doi.org/10.1002/wcc.818

Singer, T., & Klimecki, O. M. (2014). Empathy and compassion. *Current Biology*, *24*(18), R875-R878. https://doi.org/10.1016/j.cub.2014.06.054

Smith, D. H. (2019). *Determinants of individual prosociality and of collective social solidarity-cohesion: A literature review* (Vol. 4).

Statistisches Bundesamt. (2020). *Bevölkerung im Alter von 15 Jahren und mehr nach allgemeinen und beruflichen Bildungsabschlüssen nach Jahren*. Retrieved 03-01-2023 from https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bildung-Forschung-Kultur/Bildungsstand/Tabellen/bildungsabschluss.html#fussnote-1-104098

Steenkamp, J.-B. E., & Baumgartner, H. (1998). Assessing measurement invariance in cross-national consumer research. *Journal of Consumer Research 25*(1), 78-90. https://doi.org/10.1086/209528

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, *29*(3), 309-317. https://doi.org/10.1016/j.jenvp.2008.10.004

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. *Human Ecology Review* 81-97.

Stern, P. C., Dietz, T., & Guagnano, G. A. (1998). A brief inventory of values. *Educational and Psychological Measurement 58*(6), 984-1001. https://doi.org/10.1177/0013164498058006008

Stockemer, D., & Sundström, A. (2023). Age Inequalities in Political Representation: A Review Article. *Government and Opposition*, 1-18. https://doi.org/10.1017/gov.2023.11

Sutter, M., Perrin, P. B., Tabaac, A. R., Parsa, L., & Mickens, M. (2017). Do ableism and ageism predict college students' willingness to provide care for a family member with a chronic health condition? *Stigma and Health*, *2*(2), 110-120. https://doi.org/10.1037/sah0000045

Syropoulos, S., & Markowitz, E. M. (2021a). Perceived responsibility towards future generations and environmental concern: Convergent evidence across multiple outcomes in a large, nationally representative sample. *Journal of Environmental Psychology*, *76*, 101651. https://doi.org/10.1016/j.jenvp.2021.101651

Syropoulos, S., & Markowitz, E. M. (2021b). Prosocial responses to COVID-19: Examining the role of gratitude, fairness and legacy motives. *Personality and Individual Differences*, *171*, 110488. https://doi.org/10.1016/j.paid.2020.110488

Tajfel, H., & Turner, J. C. (2004). The social identity theory of intergroup behavior. In J. T. Jost & J. Sidanius (Eds.), *Political Psychology* (pp. 276-293). Psychology Press.

Taylor, L. K., & Glen, C. (2020). From empathy to action: Can enhancing host-society children's empathy promote positive attitudes and prosocial behaviour toward refugees? *Journal of Community & Applied Social Psychology*, *30*(2), 214-226. https://doi.org/10.1002/casp.2438

The Culture Factor Group. (2024). *Country Comparison Tool*. Retrieved 05-16-2024 from https://www.hofstede-insights.com/country-comparison-tool?countries=brazil%2Cgermany%2Cunited+states

Todd, A. R., & Galinsky, A. D. (2014). Perspective-Taking as a Strategy for Improving Intergroup Relations: Evidence, Mechanisms, and Qualifications. *Social and Personality Psychology Compass*, *8*(7), 374-387. https://doi.org/10.1111/spc3.12116

Trope, Y., & Liberman, N. (2003). Temporal construal. *Psychological Review*, *110*(3), 403-421. https://doi.org/10.1037/0033-295x.110.3.403

Turner, J. C. (1975). Social Comparison and Social Identity: Some Prospects for Intergroup Behaviour. *European Journal of Social Psychology*, *5*(1), 1-34. https://doi.org/10.1002/ejsp.2420050102

Turner, R. N., Hewstone, M., Voci, A., & Vonofakou, C. (2008). A test of the extended intergroup contact hypothesis: The mediating role of intergroup anxiety, perceived ingroup and outgroup norms, and inclusion of the outgroup in the self. *Journal of Personality and Social Psychology*, *95*(4), 843. https://doi.org/10.1037/a0011434

Vale, M. T., Stanley, J. T., Houston, M. L., Villalba, A. A., & Turner, J. R. (2020). Ageism and behavior change during a health pandemic: a preregistered study. *Frontiers in Psychology*, *11*, 1-12. https://doi.org/10.3389/fpsyg.2020.587911

Van Bavel, J. J., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., Crockett, M. J., Crum, A. J., Douglas, K. M., & Druckman, J. N. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour 4*(5), 460-471. https://doi.org/10.1038/s41562-020-0884-z

Van Lange, P. A., Joireman, J., Parks, C. D., & Van Dijk, E. (2013). The psychology of social dilemmas: A review. *Organizational Behavior and Human Decision Processes*, *120*(2), 125-141. https://doi.org/10.1016/j.obhdp.2012.11.003

Van Zomeren, M., Postmes, T., Spears, R., & Bettache, K. (2011). Can moral convictions motivate the advantaged to challenge social inequality? Extending the social identity model of collective action. *Group Processes & Intergroup Relations*, *14*(5), 735-753. https://doi.org/10.1177/1368430210395637

Vesely, S., & Klöckner, C. A. (2020). Social desirability in environmental psychology research: Three meta-analyses. *Frontiers in Psychology*, *11*, 1395. https://doi.org/10.3389/fpsyg.2020.01395

Voci, A., & Hewstone, M. (2003). Intergroup contact and prejudice toward immigrants in Italy: The mediational role of anxiety and the moderational role of group salience. *Group Processes & Intergroup Relations*, *6*(1), 37-54. https://doi.org/10.1177/1368430203006001011

Wade-Benzoni, K. A. (1999). Thinking about the future: An intergenerational perspective on the conflict and compatibility between economic and environmental interests. *American Behavioral Scientist*, *42*(8), 1393-1405. https://doi.org/10.1177/00027649921954912

Wade-Benzoni, K. A. (2003). Intergenerational identification and cooperation in organizations and society. In J. Polzer (Ed.), *Identity Issues in Groups* (Vol. 5, pp. 257-277). Emerald Group Publishing Limited. https://doi.org/10.1016/S1534-0856(02)05010-7

Wade-Benzoni, K. A. (2019). Legacy motivations & the psychology of intergenerational decisions. *Current Opinion in Psychology*, *26*, 19-22. https://doi.org/10.1016/j.copsyc.2018.03.013

Wade-Benzoni, K. A., Hernandez, M., Medvec, V., & Messick, D. (2008). In fairness to future generations: The role of egocentrism, uncertainty, power, and stewardship in judgments of intergenerational allocations. *Journal of Experimental Social Psychology*, *44*(2), 233-245. https://doi.org/10.1016/j.jesp.2007.04.004

Wade-Benzoni, K. A., & Plunkett Tost, L. (2009). The egoism and altruism of intergenerational behavior. *Personality and Social Psychology Review*, *13*(3), 165-193. https://doi.org/10.1177/1088868309339317

Wade-Benzoni, K. A., Sondak, H., & Galinsky, A. D. (2010). Leaving a legacy: Intergenerational allocations of benefits and burdens. *Business Ethics Quarterly*, *20*(1), 7-34. https://doi.org/10.5840/beq20102013

Wade-Benzoni, K. A., Tost, L. P., Hernandez, M., & Larrick, R. P. (2012). It's only a matter of time: Death, legacies, and intergenerational decisions. *Psychological Science*, *23*(7), 704-709. https://doi.org/10.1177/0956797612443967

Wade-Benzoni, K. A. (2008). Maple trees and weeping willows: The role of time, uncertainty, and affinity in intergenerational decisions. *Negotiation and Conflict Management Research*, *1*(3), 220-245. https://doi.org/10.1111/j.1750-4716.2008.00014.x

Wallis, H., Sieverding, T., Schmidt, K., & Matthies, E. (2022). # Fighteverycrisis: A psychological perspective on motivators of the support of mitigation measures in the climate crisis and the COVID-19 pandemic. *Journal of Environmental Psychology*, 101898. https://doi.org/10.1016/j.jenvp.2022.101898

Wickersham, R. H., Zaval, L., Pachana, N. A., & Smyer, M. A. (2020). The impact of place and legacy framing on climate action: A lifespan approach. *PloS one*, *15*(2), e0228963. https://doi.org/10.1371/journal.pone.0228963

Williams, R. M. (1947). The reduction of intergroup tensions: a survey of research on problems of ethnic, racial, and religious group relations. *Social Science Research Council Bulletin*, *57*, 153.

Yıldırım, M., Geçer, E., & Akgül, Ö. (2021). The impacts of vulnerability, perceived risk, and fear on preventive behaviours against COVID-19. *Psychology, Health & Medicine* *26*(1), 35-43. https://doi.org/10.1080/13548506.2020.1776891

Zagefka, H. (2021). Prosociality during COVID-19: Globally focussed solidarity brings greater benefits than nationally focussed solidarity. *Journal of Community & Applied Social Psychology*, *32*(1), 73-86. https://doi.org/10.1002/casp.2553

Zagheni, E. (2011). The leverage of demographic dynamics on carbon dioxide emissions: does age structure matter? *Demography*, *48*(1), 371-399. https://doi.org/10.1007/s13524-010-0004-1

Zaval, L., Markowitz, E. M., & Weber, E. U. (2015). How will I be remembered? Conserving the environment for the sake of one's legacy. *Psychological Science*, *26*(2), 231-236. https://doi.org/10.1177/0956797614561266

Zhang, F., Schell, R., Kaufman, D., Salgado, G., & Jeremic, J. (2017, 2017//). Social Interaction Between Older Adults (80+) and Younger People During Intergenerational

Digital Gameplay. Human Aspects of IT for the Aged Population. Applications, Services and Contexts, Cham.

List of Tables

List of Figures

Verzeichnis der bisherigen akzeptierten wissenschaftlichen Veröffentlichungen

de Paula Sieverding, T., Kulcar, V. & Schmidt, K. (2024). Act like There Is a Tomorrow—Contact and Affinity with Younger People and Legacy Motivation as Predictors of Climate Protection among Older People. *Sustainability, 16*(4)*,* 1477. https://doi.org/10.3390/su16041477

de Paula Sieverding, T., Merten, M., & Kastner, K. (2023). Old for young: Cross-national examination of intergenerational political solidarity. *Group Processes & Intergroup Relations*, *0*(0) 13684302231201785. https://doi.org/10.1177/13684302231201785

Matthies, E., de Paula Sieverding, T., Engel, L., & Blöbaum, A. (2023). Simple and Smart: Investigating Two Heuristics That Guide the Intention to Engage in Different Climate-Change-Mitigation Behaviors. *Sustainability*, *15*(9), 7156. https://doi.org/10.3390/su15097156

Sieverding, T., & Wallis, H. (2022). Young for Old-COVID-19 Related Intergenerational Prosocial Behavior. *Journal of Intergenerational Relationships*, *22*(1), 121-142. https://doi.org/10.1080/15350770.2022.2156651

Wallis, H., Holzen, V., Sieverding, T., Matthies, E., & Schmidt, K. (2022). How do appraisal as threat or challenge, efficacy, and environmental quality affect wellbeing in the COVID-19 pandemic?. *Frontiers in Psychiatry*, *13.* https://doi.org/10.3389/fpsyt.2022.1009977

Matthies, E., Holzen, V., Schmidt, K., Wallis, H. & Sieverding, T. (2022). Die Coronakrise als "Gamechanger" für die Transformation zur Nachhaltigkeit. In C. Soetbeerg & M. G. Ophoff (Hrsg.): *Corona und Nachhaltigkeit. Lernen aus der Krise für eine nachhaltige Entwicklung. DBU-Umweltkommunikation / Band 16* (S.87-94). Oekom.

Wallis, H., Sieverding, T., Schmidt, K., & Matthies, E. (2022). # Fighteverycrisis: A psychological perspective on motivators of the support of mitigation measures in the climate crisis and the COVID-19 pandemic. *Journal of Environmental Psychology*, *84*, 101898. https://doi.org/10.1016/j.jenvp.2022.101898

Schmidt, K., Wallis, H., Sieverding, T. & Matthies, E. (2022). Examining COVID-19-Related Changes toward More Climate-Friendly Food Consumption in Germany. *Sustainability, 14*(7)*,* 4267. https://doi.org/10.3390/su14074267

Schmidt, K., Sieverding, T., Wallis, H., & Matthies, E. (2021). COVID-19–A window of opportunity for the transition toward sustainable mobility?. *Transportation Research Interdisciplinary Perspectives*, *10*, 100374. https://doi.org/10.1016/j.trip.2021.100374

Oktober 2020: Verleihung des Promotionsstipendiums der Deutschen Bundesstiftung Umwelt

Ehrenerklärung

Ich versichere hiermit, dass ich die vorliegende Arbeit ohne unzulässige Hilfe Dritter und ohne Benutzung anderer als der angegebenen Hilfsmittel angefertigt habe; verwendete fremde und eigene Quellen sind als solche kenntlich gemacht.

Ich habe insbesondere nicht wissentlich:

- Ergebnisse erfunden oder widersprüchliche Ergebnisse verschwiegen,
- statistische Verfahren absichtlich missbraucht, um Daten in ungerechtfertigter Weise zu interpretieren,
- fremde Ergebnisse oder Veröffentlichungen plagiiert,
- fremde Forschungsergebnisse verzerrt wiedergegeben.

Mir ist bekannt, dass Verstöße gegen das Urheberrecht Unterlassungs- und Schadensersatzansprüche des Urhebers sowie eine strafrechtliche Ahndung durch die Strafverfolgungsbehörden begründen kann.

Ich erkläre mich damit einverstanden, dass die Arbeit ggf. mit Mitteln der elektronischen Datenverarbeitung auf Plagiate überprüft werden kann.

Die Arbeit wurde bisher weder im Inland noch im Ausland in gleicher oder ähnlicher Form als Dissertation eingereicht und ist als Ganzes auch noch nicht veröffentlicht.

Magdeburg, den 12.06.2024

Theresa Sieverding