Gen Ex

An integrated approach to intergenerational education

Harvard Summer School - Paris

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Abstract

Generational Exchange (GenEx) is an online platform to facilitate offline, bidirectional mentoring between youth (13-26) and adults of the Third Age (50-70). The "why" of the project is inspired by evolutionary arguments for intergenerational partnerships, such as the Grandmother Hypothesis.

GenEx will harness the wisdom and experience of "Third Age" adults, who are transitioning from midlife to elderliness (ages 50-70). Its purpose is twofold: to balance the Parisian job market by offering youth mentorship and career-related skills while giving more experienced adults a renewed sense of purpose. Today, more than 33% of France is over the age of 50, with the "baby boomers" bulge and a growing "silver economy." They are an underutilized resource for the 23.7% of the total labor force, ages 15-24, who are unemployed.

The "how" of GenEx derives from cellular signaling cascades, which inspire GenEx's social infrastructure for continuous learning in an amplifying process. By matching youth with Third Age adults, facilitating offline, face-to-face interactions, and creating local communities of mentorship, GenEx seeks to redefine intergenerational relationships and reinvigorate Paris.

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Transforming Society's Perspective

Transforming the Smart City:
From Biology to Society

Smart Cities seek to respond to urban challenges in an increasingly interconnected and technological world, by maximizing the participation of residents in innovations to improve their quality of life. This approach directly aligns with principles of evolution at the population, cellular, and molecular level.

From a beautiful, elegant reapplication of what evolution has selected in the human species ("Why"), to a renewed view of society informed by recent cellular discoveries ("Who"), to a implementation model based on molecular signaling cascades ("How"), GenEx represents the integration of biology and society:
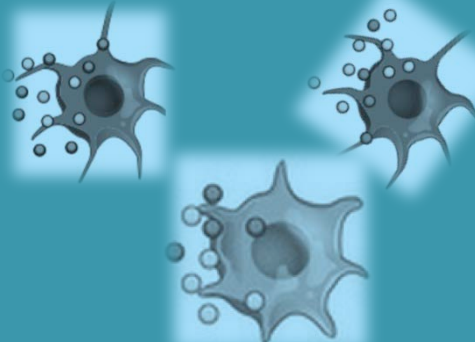
"Why"   **"Who"**   **"How"**

Population:
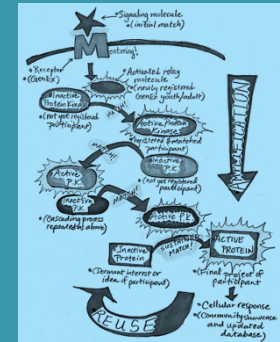The Grandmother Hypothesis
→ Evolutionary role of elderly

Cellular:
Senescence
→ Individualized functions

Molecular:
Signaling cascades
→ Amplification and reuse

Biological "Why" –
Human evolution selected for partnerships between generations. It is time to take this further.

The Grandmother Hypothesis is one example of an evolutionary argument for the role of older adults. It explains, in part, the potential longevity, late maturity, and midlife menopause of women and ultimately, why humans invest more in somatic longevity than other primates.

The hypothesis argues that menopause, a long post-fertile period, could confer an evolutionary advantage as elderly women feed and care for the very young, even when they themselves can no longer reproduce. In fact, the role of grandmothers could have been so important that the age of onset for menopause has been conserved, even as humans achieve longer lifespans and later maturity.

GenEx taps into the highly adaptive concept of altruism underlying the Grandmother Hypothesis. In biology, altruism refers to acts that help another individual without any benefit to oneself. By flexibly connecting and optimally utilizing resources of individuals, an entire species becomes greater than the sum of its parts. In society, when members of a community reach across generational differences to establish a deep connectivity, society can also acquire renewed adaptability and resilience. The transformative, evolutionary story: we are stronger as a society than as individuals.

Two Problems...

Silver Tsunami → **Causes** → **Youth Unemployment**
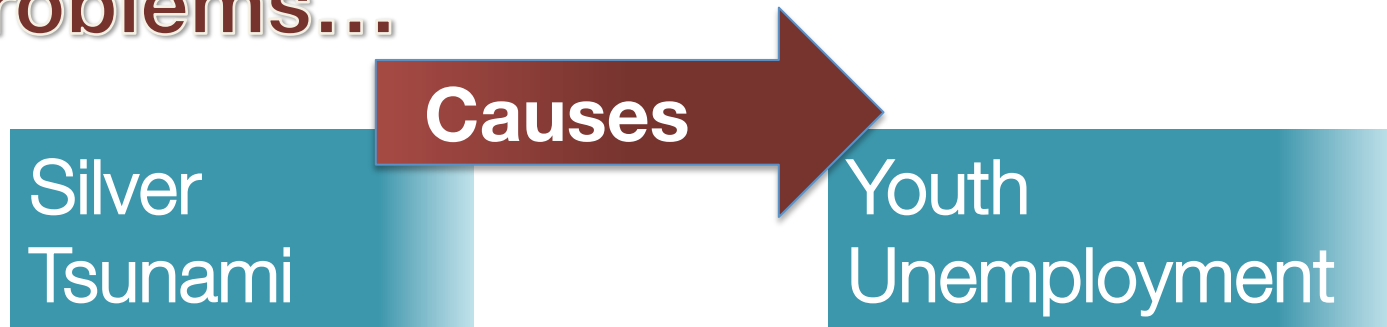
Societal "Why" –
It is time to transform the way Paris relates two concurrent social issues.

Generational Exchange (GenEx) is an online platform to facilitate offline, bidirectional mentoring between youth (13-26) and older adults of the Third Age (50-70). GenEx will address two problems Paris is facing:

Youth Unemployment. In France, 23.7% of the total labor force (ages 15-24) was unemployed in 2013 (World Bank). A major factor contributing to unemployment is lack of experience, and global educational trends are not helping. For example, the proportion of teens with part-time jobs has halved, from 40% in 1990 to 20% today.

Silver Tsunami. While older adults constitute a "silver economy" of wealthier citizens that many cities want to attract, the growing number also poses unique challenges and social misconceptions. In particular, many believe that older adults must retire to open higher jobs for youth. This sparked massive street protests by French university students in 2009 against raising the retirement age from 60 to 62. However, evidence from the Wharton School points to the opposite: policies encouraging earlier retirement actually damage youth employment, as resulting increases in pension costs must be financed by higher taxes, causing employers to cut down job positions and salaries.

…Or One Solution?

Silver Tsunami → **Solves** → **Youth Unemployment**
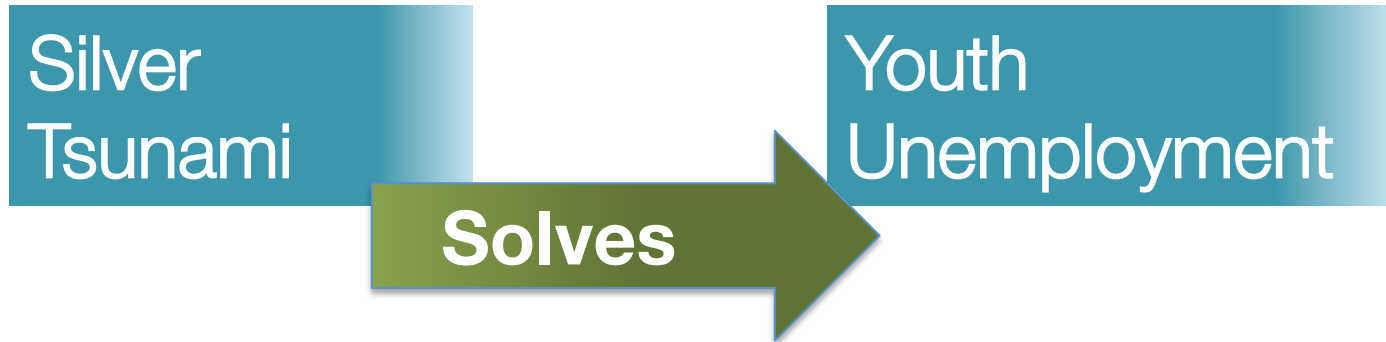
GenEx is part of a paradigm shift.

Research from the Sloan Center on Aging and Work suggests that most older employees seek not full retirement, but rather a change in the way they work, to continue work in some fashion without stopping altogether. In this new career stage, they look for flexible jobs with a climate of respect and learning opportunities.

Rather than exacerbating the job market for youth, why can't the growing elderly population contribute to expanding it? While older adults often stay within their workplace in their last career stage, youth often find new jobs in fields like e-commerce, information systems, and social media. As older workers seek meaning in phased retirements and youth look to build their careers, many economists envision partnerships and mentoring relationships between them. Transferring skills between generations can increase the competitiveness of youth while giving older adults a renewed sense of purpose, easing the transition to retired life.

What is the "Third Age"?

Also known as the "age of usefulness," the Third Age is a group of people transitioning from midlife to elderliness, also known as the "Baby Boomers" in the present-day
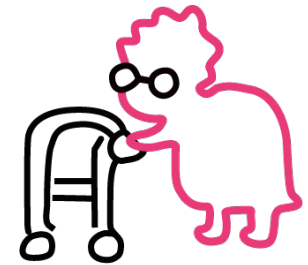
Childhood & Adolescence

Childrearing & Midlife

Third Age

Frailty & Decline

Our Theory of Change –
By what mechanisms will personal relationships through GenEx alleviate youth unemployment?

As retiring professionals enter the **"third age,"** also known as "the age of usefulness," they have both experience from the past and free time in the present. "Third age" adults can thus contribute wisdom that transcends information from the Internet, offering:
- ✓ Training in job related skills
- ✓ Connections to jobs
- ✓ Soft skills, e.g. interacting with authority figures

Connecting the Young and Old

Biological "Who" –

As we strive to build a *smart, healthy city*, let us look to the "generational exchange" between young and old cells of the body. Recent research has clarified the role of *senescence*, or aging, on the cellular level.

Rather than an oversimplified, irreversible "stop point" that acts to protect against cancer, aging involves a complex set of phenotypically diverse stages that progress after this initial growth arrest.

Aging cells have specific roles and timelines that are narrowly defined by genes, growth factors, and proteases, which allows a unique purpose for each cell and limits harmful effects of age.

Young cell

Senescence

Injury repair

Wound healing

Development
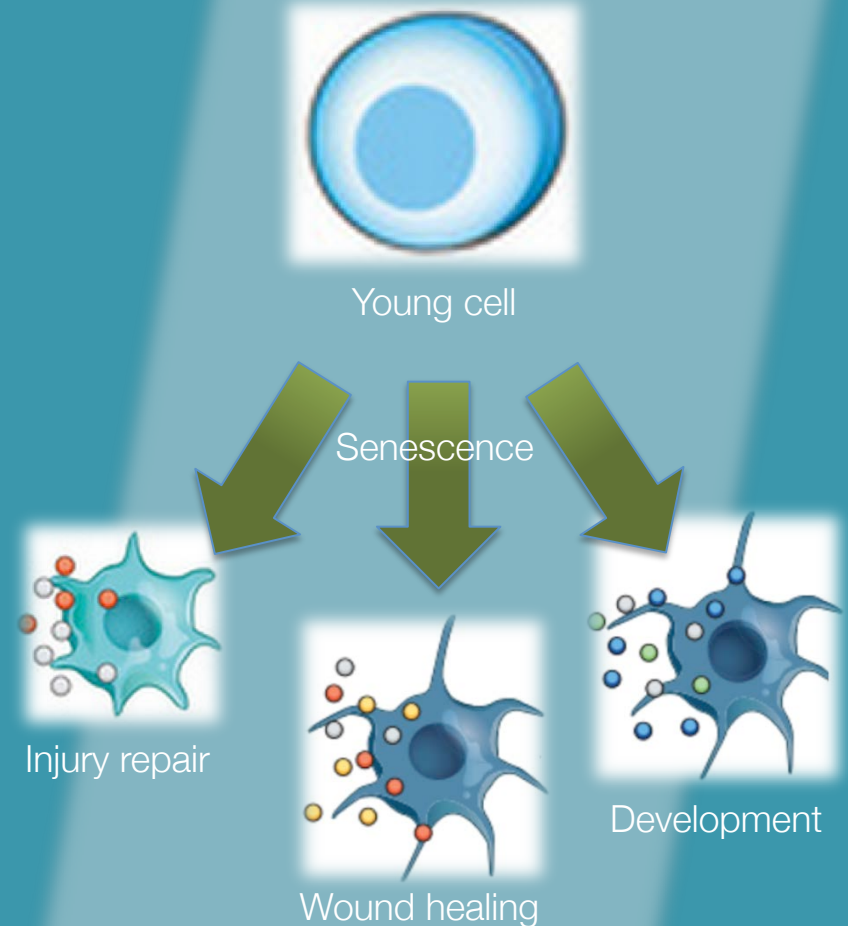
From Cellular Functions…
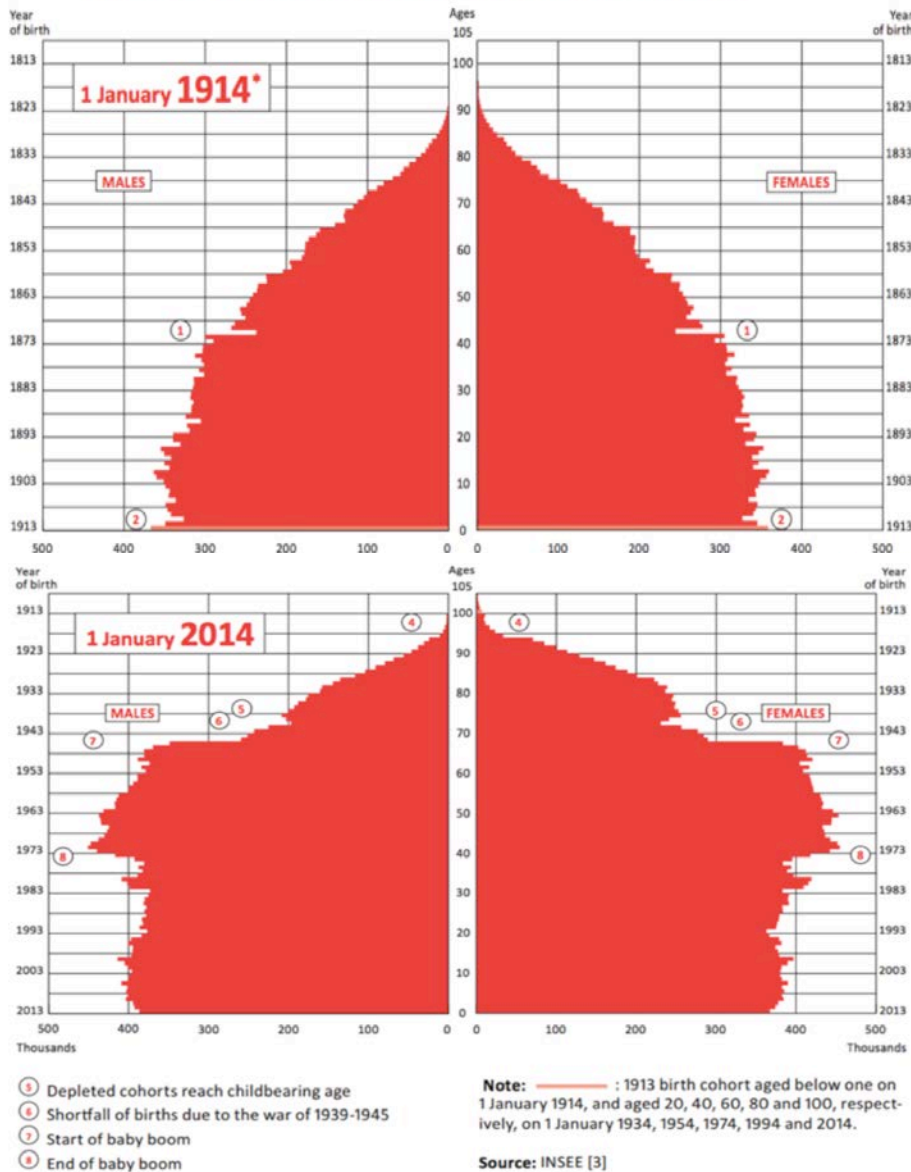
Societal "Who" –

Researchers use the molecular mechanisms of senescence to develop new therapeutic strategies for age-related pathologies, extending the healthy lifespan (Deursen). Likewise, society must deeply understand the unique stages of aging and tap into the possibilities of each one, developing new strategies to address social issues. One could argue that this will prevent *"early senescence"* of city dwellers.

Thus, GenEx seeks to target the **"third age"** population by intervening before "senescence" and empowering them to pass on their knowledge and skills to youth, especially as unemployment rises around Paris.

Youth

Third Age

Personal mentorship

Mental health and wellbeing

Educational experience

Professional development

… To Societal Roles

Population pyramid of France: changes from 1914 to 2014

Year of birth — 1 January 1914* — MALES — FEMALES — Ages 105...0 — Year of birth — 500 400 300 200 100 0 0 100 200 300 400 500

Year of birth — 1 January 2014 — MALES — FEMALES — Ages 105...0 — Year of birth — 500 400 300 200 100 0 0 100 200 300 400 500 — Thousands

⑤ Depleted cohorts reach childbearing age
⑥ Shortfall of births due to the war of 1939-1945
⑦ Start of baby boom
⑧ End of baby boom

Note: ———— : 1913 birth cohort aged below one on 1 January 1914, and aged 20, 40, 60, 80 and 100, respectively, on 1 January 1934, 1954, 1974, 1994 and 2014.

Source: INSEE [3]

Aging demographics of Paris –

Today, more than 33% of France is over the age of 50, with a bulge between ages 40 and 70. It will be at least fifty years until demographic effects of WWII disappear and the last baby-boomers of the early 1970s pass away.

For now, this population has been labeled by the market as "seniors" or the "silver economy" (RFI). France has been known to have generous government pensions and a relatively early retirement age (62 for full pensions).

However, this age has been steadily increasing, both by law and by personal choice. Thus, more adults are working part-time, so that youth feel like they are competing with older, more experienced adults for limited job offers.

Where are Third (and Fourth) Age Parisians? – Those between the ages of 50 and 70 can be found in virtually every neighborhood, but those who are older may be concentrated in areas that have more elderly-related facilities. Since GenEx will match participants based on geographic proximity for face-to-face interaction, we may partner with local facilities to host offline events.
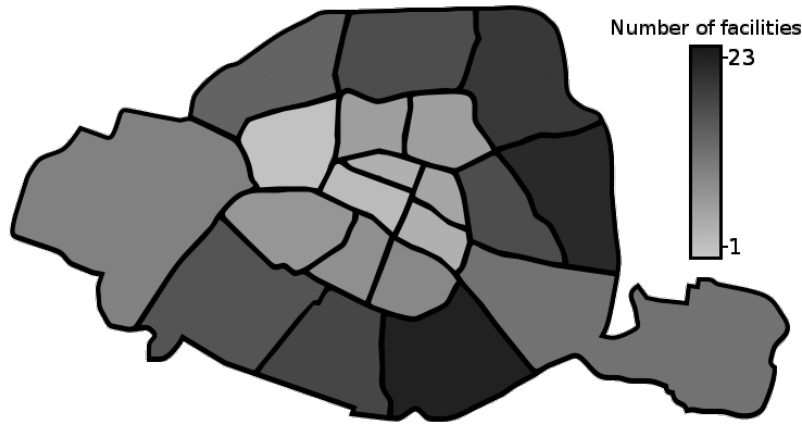
Total number of nursing homes per arrondissement
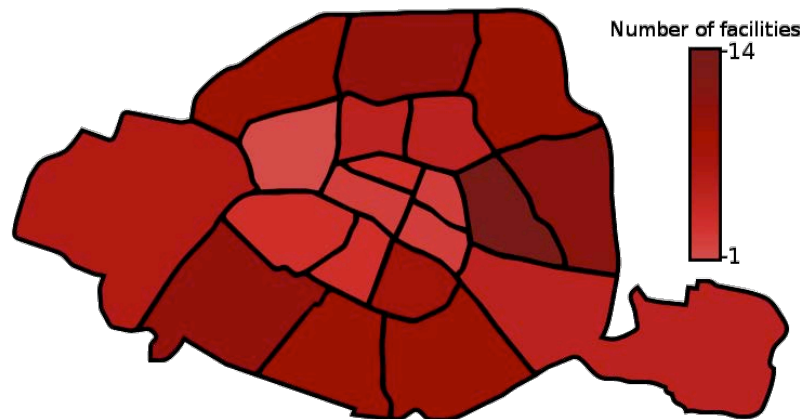
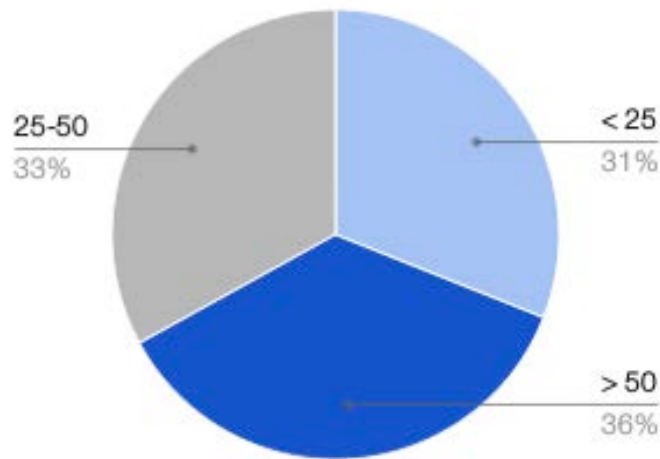Total number of independent living facilities per arrondissement

Elderly-related facilities include (i) **day care centers**, which offer programmed activities to promote well-being during daytime hours, (ii) **retirement homes**, which are multi-residence housing facilities intended for seniors, (iii) **rehabilitation centers**, which offer therapy and training for seniors following injuries, and (iv) **independent living facilities**, which offer services such as laundry, dining, and appropriate healthcare to otherwise self-sufficient adults. They are collectively mapped here as "**nursing homes**."

Of Parisians between the ages of 50 to 70, those who live in retirement home are most likely to live in **independent living facilities**, which represent majority of Parisian nursing homes (126 out 219). Each arrondissement has at least one, as mapped here.
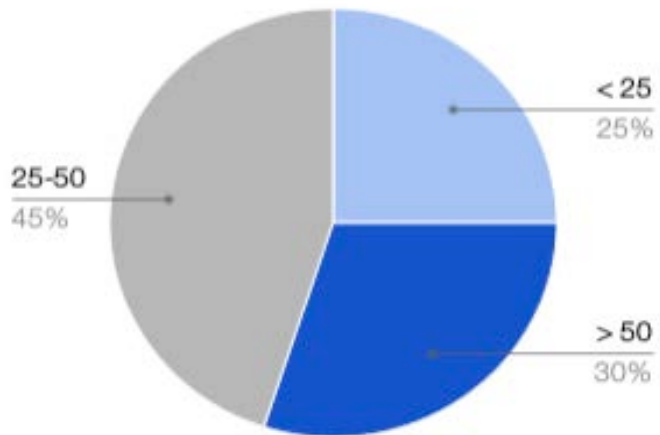
If we want to target this population and expand to older Fourth Age Parisians, it will be helpful to have partnerships, starting in neighborhoods with more independent living facilities. Thus, beta tests of GenEx can start with the 13th, 19th, and 20th arrondissements.

The Third Age and Technology –

How will Third Age adults react to a platform that relies so heavily on web tools? It will range!

In 2011, Internet users over 50 years of age were more numerous (30% of users) than those under 25 (25%). This is mainly because they represents more than a third (36%) of the population, whereas youth are less numerous (31%, including babies and kids that are not using the Internet).

We can conclude that the people over 50 are quite tech-savvy. (Many of them practiced with the Minitel, the precursor of the PC, during the 1980's.) Nevertheless, their comfort with web tools is very heterogeneous. The main factor is not age, but rather social or professional background.

Among older adults who are comfortable with new technologies, many only know how to use one or two applications. In addition, they like to be guided, but not assisted. GenEx will address these issues by having a simple and clear interface, similar to those with which older adults are already familiar. The front page will display a video tutorial, and help notes will be throughout the website.

GenEx will have to rely on offline methods, such as advertisements in parks and public spaces, word of mouth, and community workers or "ambassadors" to guide users in person.

Age distribution
in France (2011)

25-50
33%

< 25
31%

> 50
36%

Age distribution among
French Internet users (2011)

25-50
45%

< 25
25%

> 50
30%

For both the youth (under 25) and the Third Age (50-75), the main motivation to use Internet is communication. However, most youth are using social media, while the third age adults are using e-mails.

GenEx would meet the communication needs of both generations to foster social connections between them.

Age distribution in France, focusing on Third Age, ages 50-75 (2011)

25-50 and > 75
41%

< 25
31%

50-75
28%
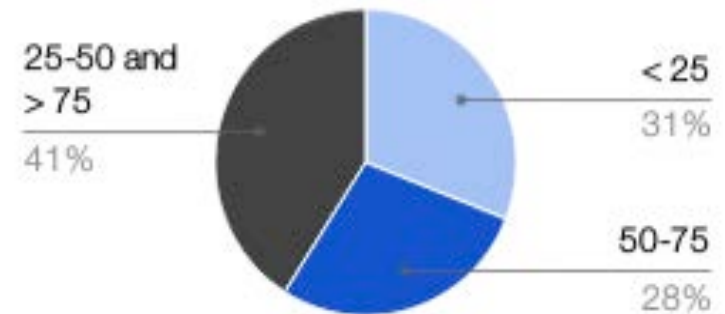
Age differences in the use of online tools (2011)
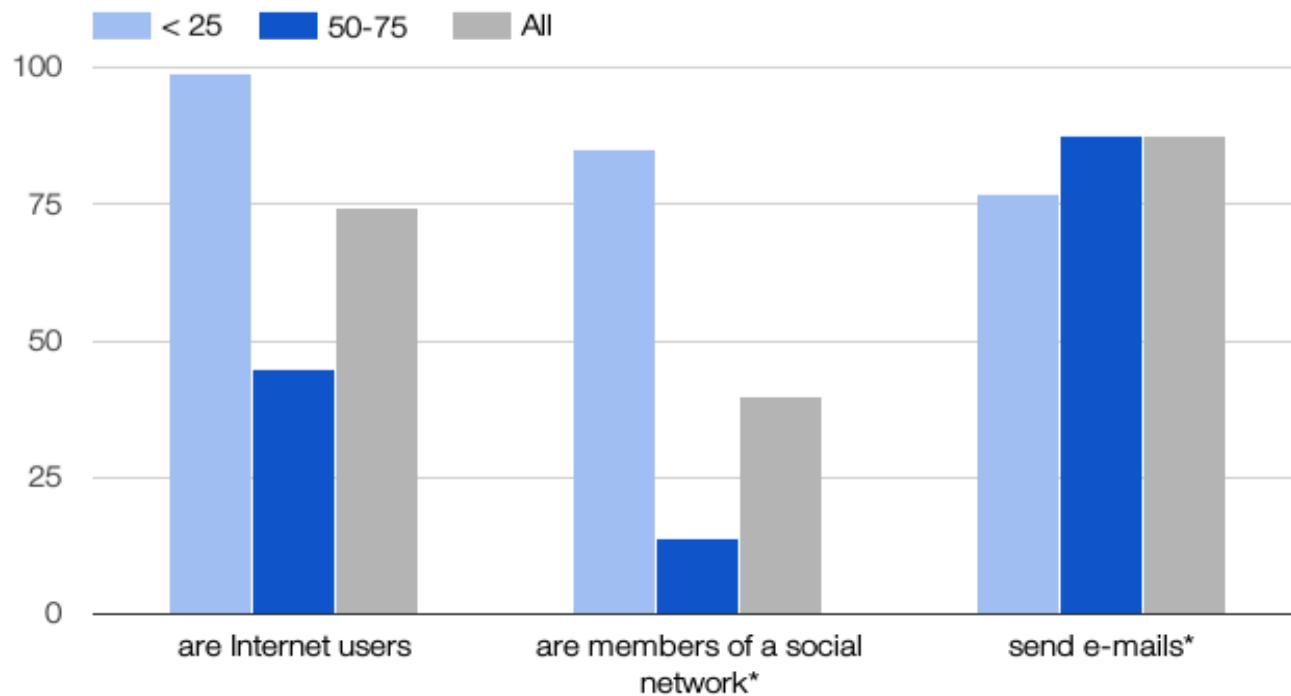
< 25   50-75   All

are Internet users   are members of a social network*   send e-mails*

*:among Internet users

Empathy-Centered Approaches

What sister programs are out there?
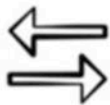
Multiple intergenerational programs have tapped into the potential of Third Age adults. For instance:

1. **Speaking Exchange CNA**: an online platform for elderly in the U.S. to converse with English students in Brazil.
2. **Match & Swap**: an online platform for elderly and youth to find similar interests and initiate bidirectional mentoring relationships.
3. **ONEgeneration**: an integrated nursing home and nursery, where elderly care for children during the day.
4. **Reverse Summer School**: a new program launched from OpenIDEO, for young students to give classes to elders in vacant classrooms during summer vacation.
5. **COS Alice Guy**: a nursing home that includes la crèche, a garden in collaboration with a next-door nursery that serves an educational space and site for daily play dates with the children, ages 0-4

What makes GenEx different?

GenEx lies at the intersection of two axes:

Volunteer vs. Incentivized. For self-sustaining programs, it is crucial to motivate participation by both youth and third age adults.

While certain programs rely on the social benefits of intergenerational interactions to recruit volunteers (Match & Swap, COS Alice Guy, and ONEGeneration), others provide payment or school credit to younger participants (Reverse Summer School and Speaking Exchange CNA, respectively).

GenEx integrates these two sources of motivation.
While offering social benefits to volunteers,
we will also offer 2 incentives:
- A "gamified" online platform and a "point system"
- An opportunity to gain concrete job-related skills

Online

Match and Swap

Speaking Exchange CNA

GenEx

Volunteer

Incentivized
(Pay/Grades)

COS Alice Guy

Reverse Summer School
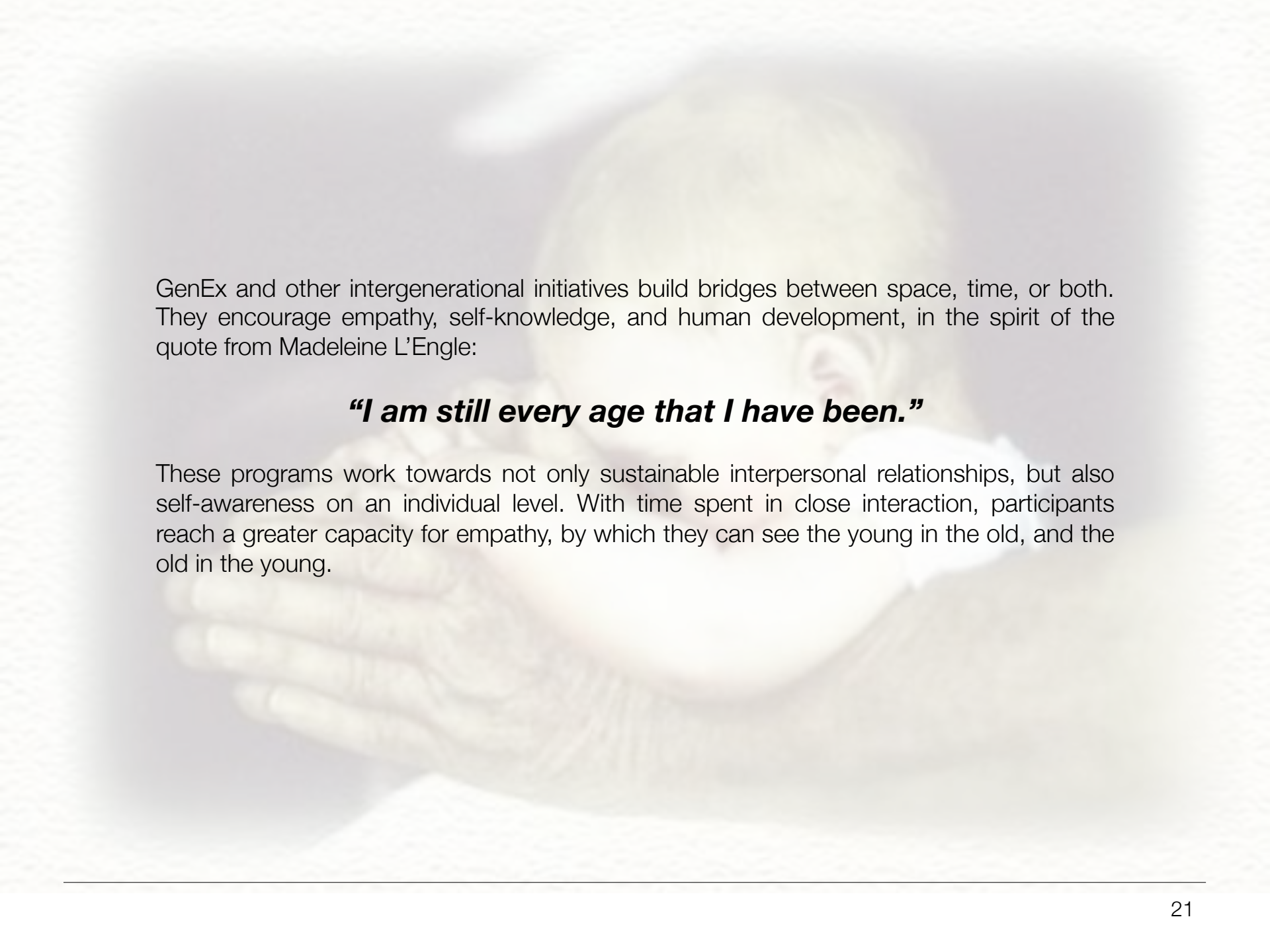
and ONEgeneration
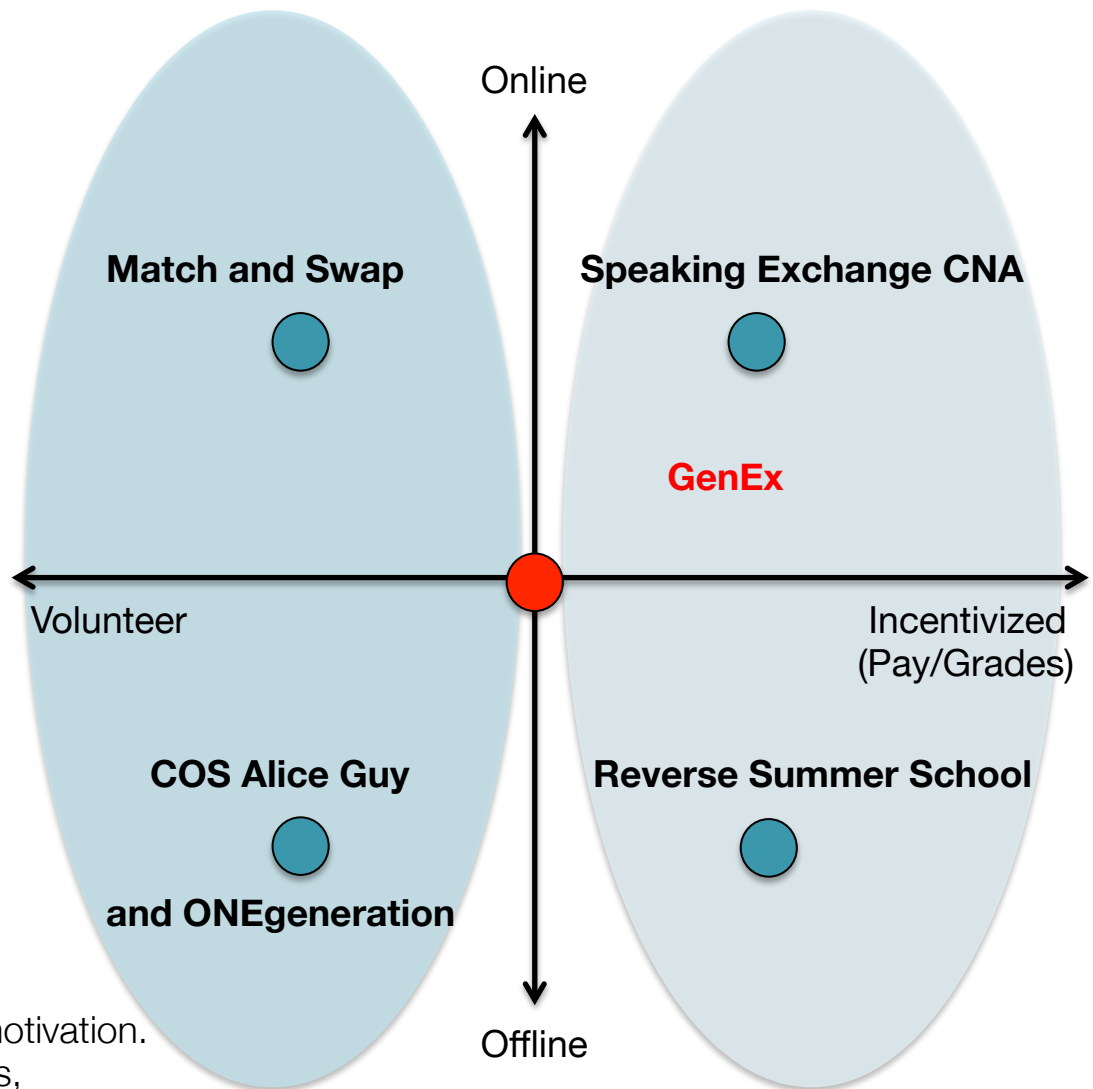
Offline

Offline vs. Online. Though face-to-face interactions most directly lead to social benefits and increased empathy, websites have the advantage of flexibility and scalability.

While certain programs take place in set physical settings (COS Alice Guy, ONEGeneration, and Reverse Summer School), others utilize online tools like videoconferencing and specially designed web interfaces (Match and Swap, Speaking Exchange CNA).

GenEx integrates both offline and online interactions. After registration and matching on the website, each sub-goal of the participants should represent an offline meeting between pairs. This is especially appropriate for dense cities like Paris, where young and old are living in close proximity or have access to public transit.

Online

Match and Swap

Speaking Exchange CNA

GenEx

Volunteer

Incentivized
(Pay/Grades)

COS Alice Guy

Reverse Summer School

and ONEgeneration

Offline
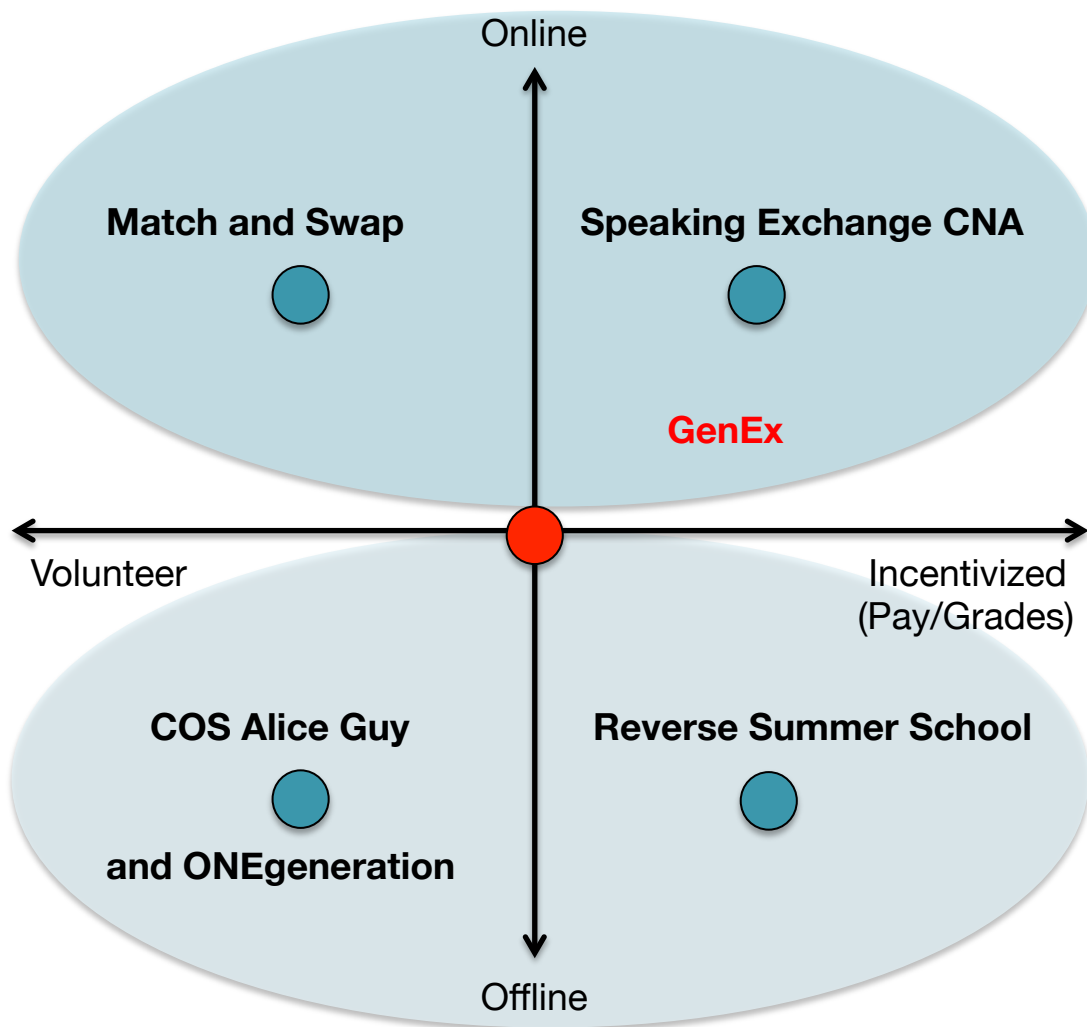
Once the deadline is reached and each pair's final projects are complete, they will have the option of showcasing their tutorial or project, live, to a local group of people. This will be an important opportunity for each participant to give and receive inspiration in the community.

GenEx and other intergenerational initiatives build bridges between space, time, or both. They encourage empathy, self-knowledge, and human development, in the spirit of the quote from Madeleine L'Engle:
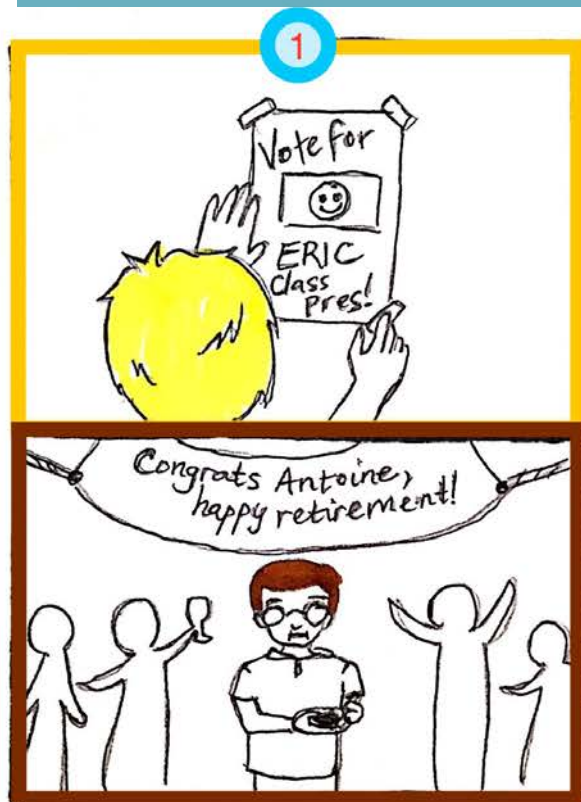
"I am still every age that I have been."

These programs work towards not only sustainable interpersonal relationships, but also self-awareness on an individual level. With time spent in close interaction, participants reach a greater capacity for empathy, by which they can see the young in the old, and the old in the young.

Experience Map & Execution Plan

Eric, a high school junior, is running to be class president and must give a speech. He is so nervous that his hands are shaking as he puts up posters.

Meanwhile, Antoine, who is now in his sixties, is retiring. His colleagues throw a party, but he wonders what he should do with all his free time now.

Eric's teacher recommends GenEx for gaining speaking experience and training.

Antoine, while checking his LinkedIn, comes across a link to GenEx, addressed to "all with great experience, interested in mentoring." Intrigued, he asks his colleagues, many of whom know of the service.

Eric registers as a "youth" on the GenEx website, listing what he can teach others (photography, guitar), and what he wants to learn. Speaking is his top priority.

Antoine does the same, logging in to the "third age" page of the site, putting in the skills he can teach, and what he wants to learn (nature photography).
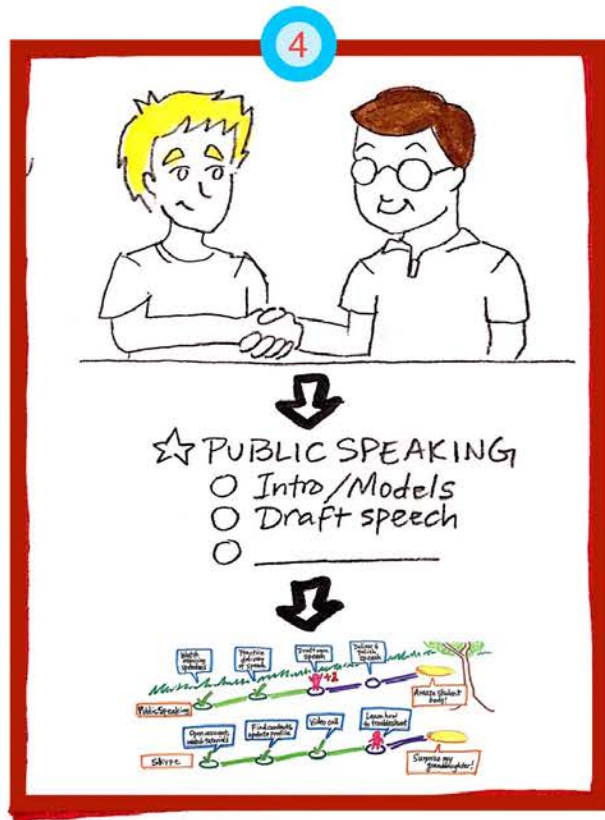
Eric and Antoine meet for the first time at a café. They set subgoals and deadlines. They meet every week as available, whether at the café, Eric's apartment, or Antoine's home. Each time Eric or Antoine progresses, he gains a point and advances on the online "game."
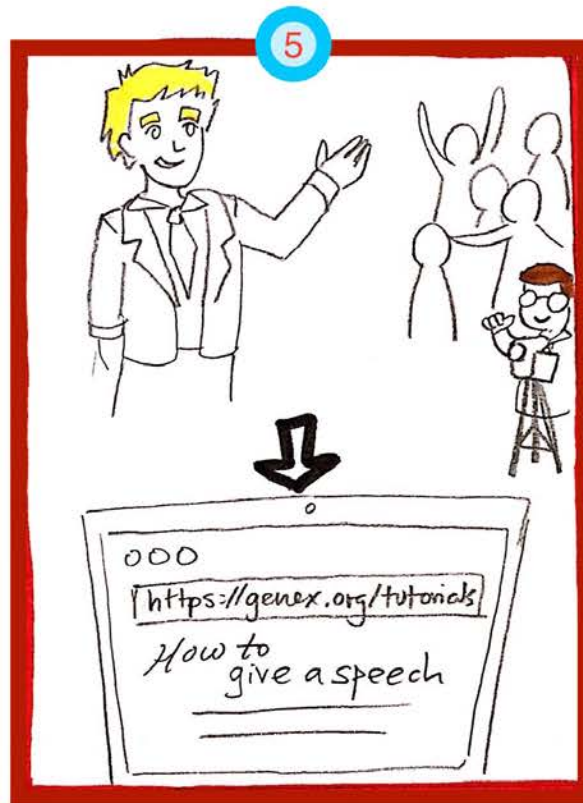
Finally, Eric is ready to deliver his speech to his class. Antoine is there to support (and videotape) him!
Afterwards, they meet for one last mentoring session, where they compile the videoclips and their notes into an online tutorial.

Antoine is also ready to showcase his photography. For this, a local GenEx showcase is ideal. Eric is proud to be recognized as Antoine's young mentor. They also upload a few more examples to the existing photography tutorial on GenEx and add extra tips.

Online tools to facilitate offline interactions –

GenEx will follow a minimalist design inspired by Google material design, for greater approachability and accessibility for all ages.

Our simple matching interface will be based on:
1. Job experience and desired skills
2. Location

Local prototypes will follow a:
1. Bottom-up approach with an initial "manual" matchmaking (of 5 youth and 5 Third Age adults in Paris), followed by
2. Progressively abstract algorithms for automatic matchmaking

Lingering questions –

How can we refer matches to the best meeting spots and ensure consistency of mentoring quality?

How do we increase abstraction of our technology stack to be self-sustaining and obtain users without expensive advertisement?
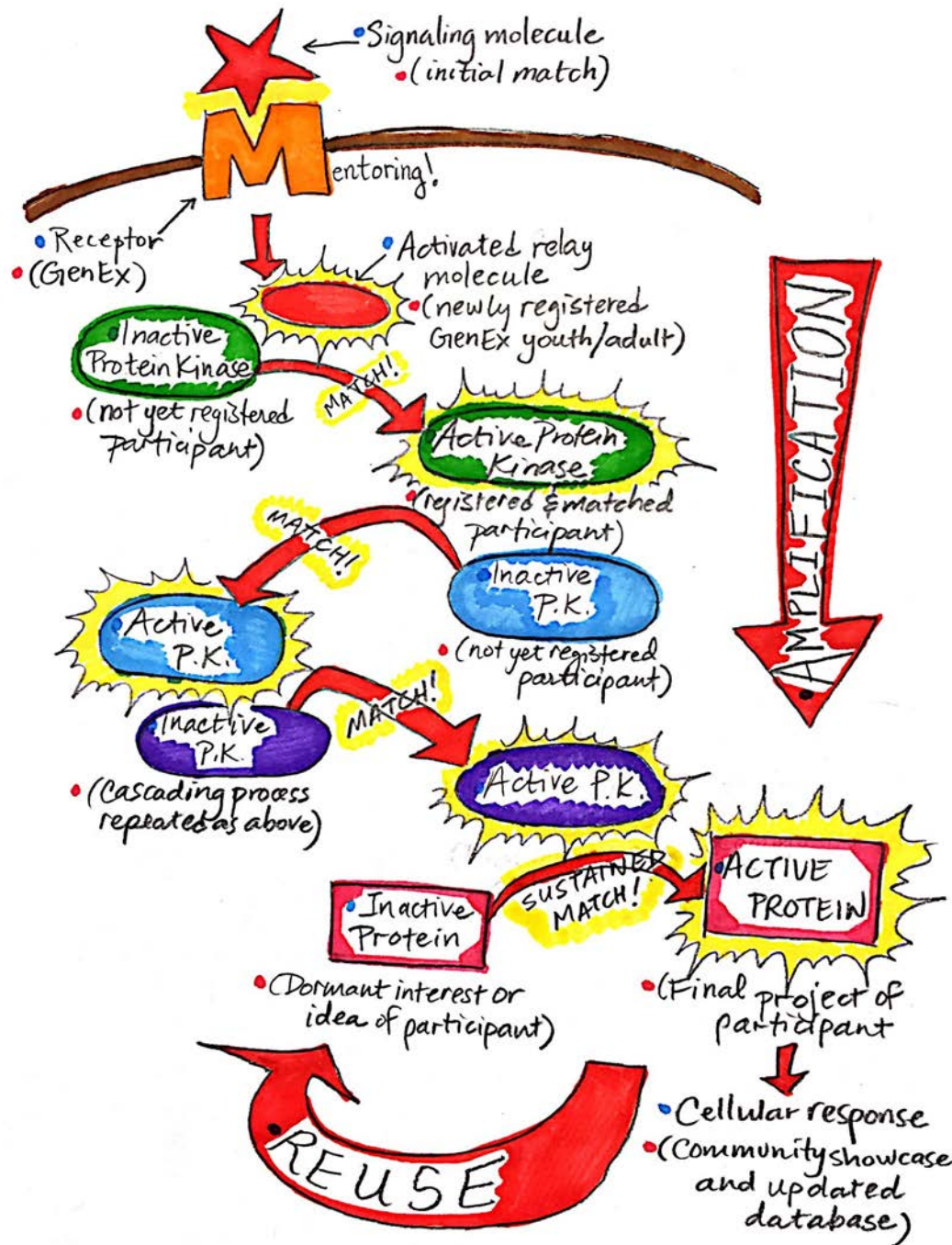
Biological "How" –

To address our lingering questions, we harken back to a cellular signaling molecule, which matches up with its corresponding receptor on the cell surface to elicit a physical or chemical response from the entire organism within miniscule fractions of a second.

- *GenEx acts as a receptor* to create an initial match and delegates the mentors to a specific meeting place from a choice of many.

- *Each step is like a protein kinase activation* in a signaling cascade, that culminates in a cellular response, which in our case will be a project that combines the bidirectional mentoring efforts into a useful idea for the community around them.
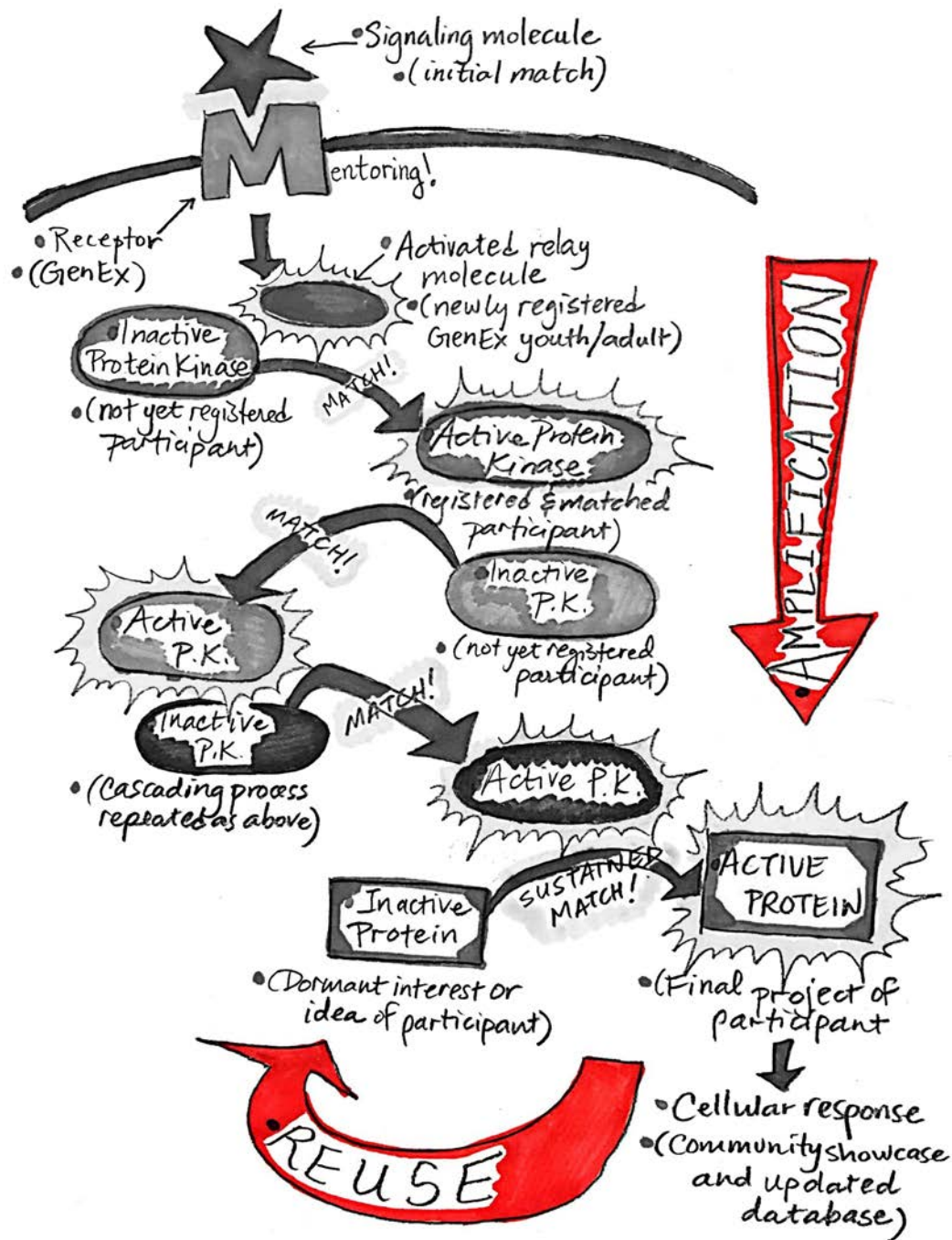
Signal cascades have two main benefits:

- **Amplification** of signals at orders of magnitude beyond what a single, linear system could do.

  - A single match can subsequently lead to dozens more. Experienced mentors can train new participants.

  - Partnerships with community spaces such as schools, workplaces, and retirement homes can help expansion.

- **Reuse** of components, similarly to how protein phosphatases render active kinases inactive by cleaving phosphates and releasing energy.

  - New projects can build upon existing ones, as users update tutorials online.

  - Reusability can decrease the friction and cost of implementing GenEx.

Thus, GenEx can **amplify** responses and **reuse** end results to scale from local beta tests to a global network.

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Execution Timeline

First Matches
First 10 matches and mentorship relationships are carried out, and 10 community projects are added to the online database.

Expansion
GenEx expands to other cities as a popular platform, and thousands of bidirectional mentorships occur, spreading knowledge and expertise in a sustainable way.

Creation of Prototype   3 Months   5 Years

2 Weeks   1 Year   Worldwide Expansion

Launch
Matches are local and personal, manually managed by the founding team. A "speed-dating" event to introduce the registration system in the 13th arrondissement occurs.

Self-sustaining
GenEx becomes a self-sustaining online platform. Hundreds of mentorship pairs occur. Impact Assessment and fine-tuning (empathy/mentorship training, "curricular" and "apprenticeship" models for mentorship)

Biological Recap –

Throughout the design of GenEx, the biological has driven the societal. By tapping into the resources of Paris as an intellectual, socially innovative, and economic powerhouse, biologically inspired projects can create new models for engaging its citizens.
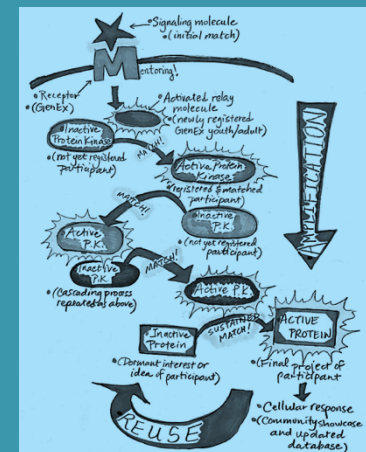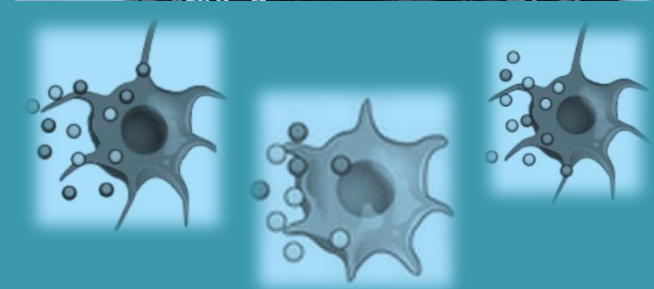
"Why"
The Grandmother Hypothesis (Evolutionary)
→ Evolutionary role of elderly

"Who"
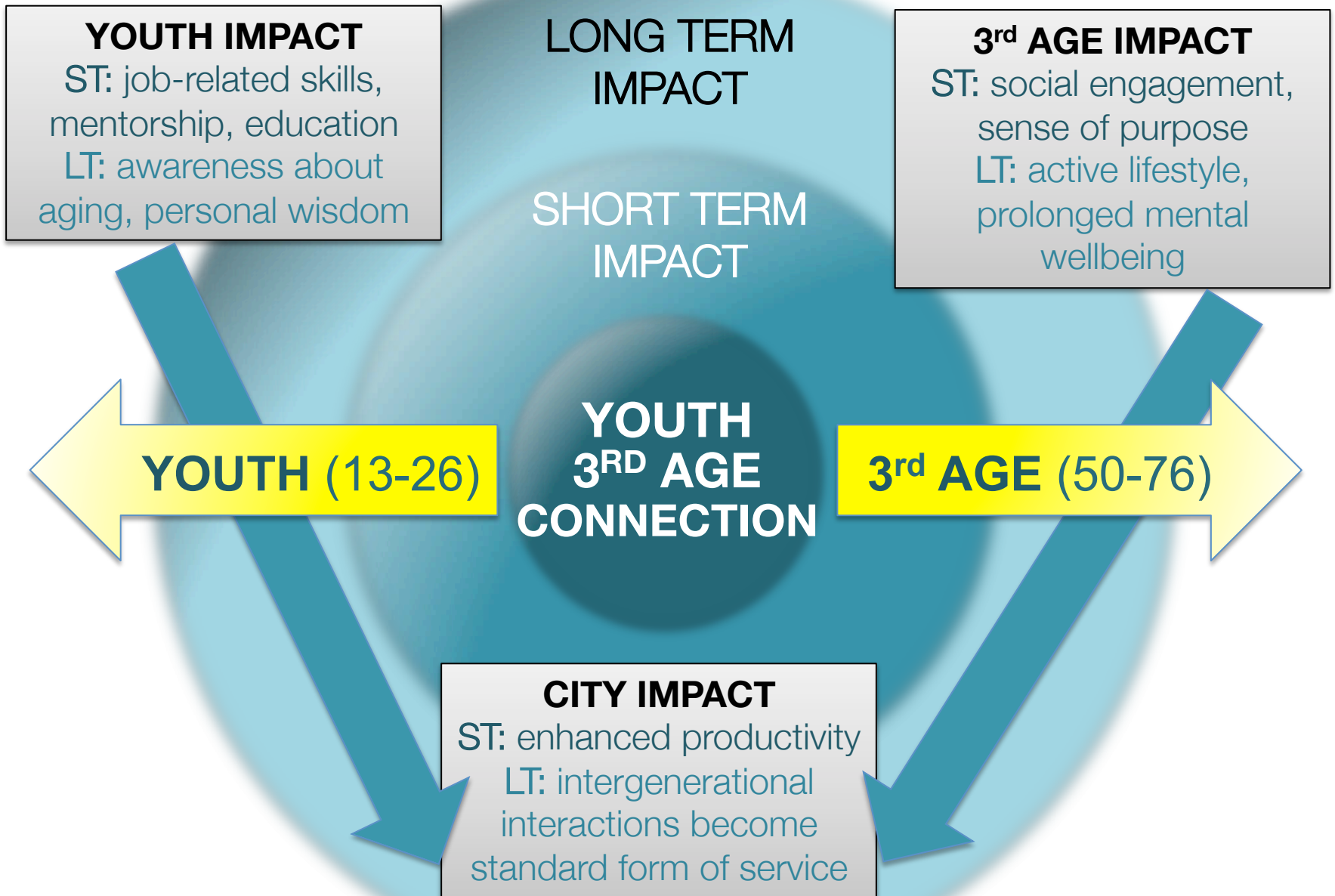Senescence (Cellular)
→ Specific functions of individual mentors

"How"
Signaling cascade (Systems)
→ Amplification of impact and reuse of components

Impact Assessment Plan

YOUTH IMPACT
ST: job-related skills, mentorship, education
LT: awareness about aging, personal wisdom

LONG TERM IMPACT

3ʳᵈ AGE IMPACT
ST: social engagement, sense of purpose
LT: active lifestyle, prolonged mental wellbeing

SHORT TERM IMPACT

YOUTH 3ᴿᴰ AGE CONNECTION

YOUTH (13-26)

3ʳᵈ AGE (50-76)

CITY IMPACT
ST: enhanced productivity
LT: intergenerational interactions become standard form of service

GenEx will make both personal and societal impacts, on both the short and long term scale.
We can directly assess the satisfaction of both Third Age and the youth participants by asking for feedback
about their experience, evaluating their projects, and observing changes in the community.

Specific indicators of success, both quantitative and qualitative, are summarized in "game" form here.
GenEx seeks to win as many points as possible, for individual participants (+1) and for the city (+100)!!
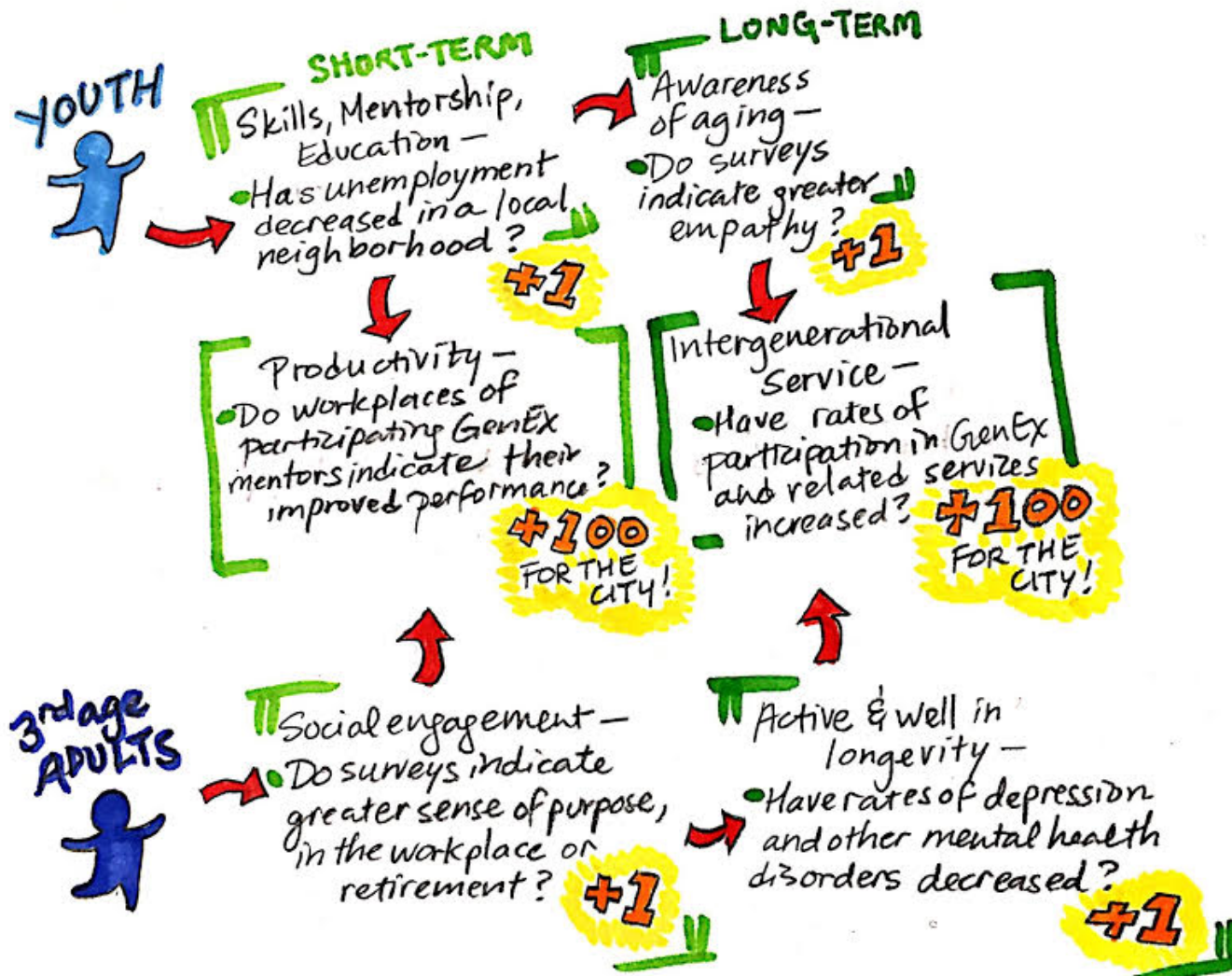
Beyond GenEx

It will be important to evaluate the extent to which the program achieves each impact proposed. This will allow us to judge the quality of GenEx, assess its potential lifespan and scalability, and propose ways to improve.

As we develop the GenEx prototype, the biological basis for inspiration and improvement will become highly apparent. The power of visualizing Smart Cities as living systems, based on the complex machinery that makes life work, gives us a perspective that is both robust and detail oriented.

By modeling our logistics plan after biological signal transduction pathway, GenEx can start from abstract mechanisms and increase specificity, using components such as kinase activation to address obstacles and discover new metrics to gauge impact. Such a reusable design ideology gives us the ability to improve our platform without losing our methodological foundation.

This is the essence of the scalability we envision in GenEx. Even if it starts small, it can be entirely implemented in any city of a similar infrastructure of Paris. This is just the beginning of a wave of innovation in smart cities that will have far-reaching effects

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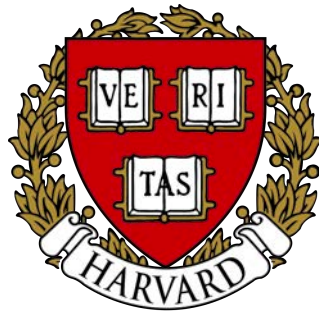
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