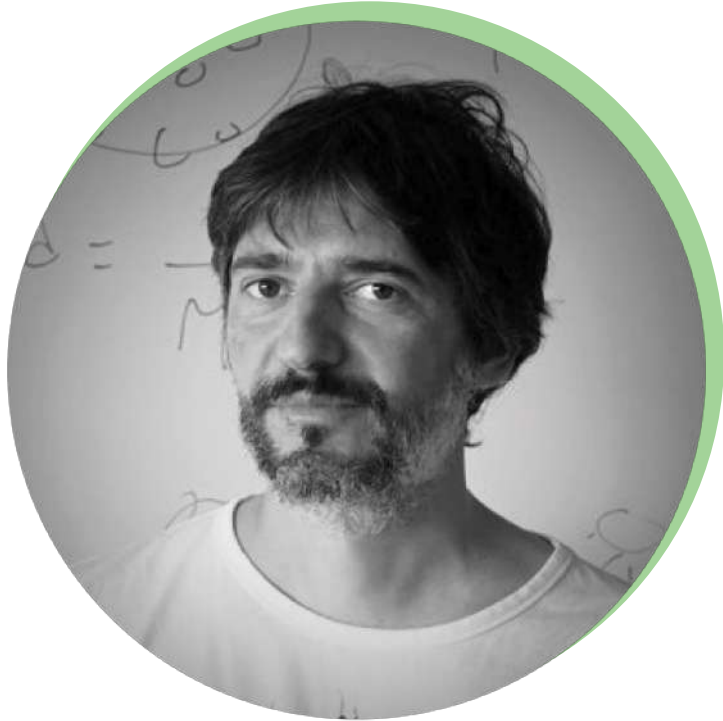




Dr. Josep Perelló

La dimensión social de la ciencia ciudadana

Catedrático en la Universidad de Barcelona (UB).
Investigador del Instituto de Sistemas Complejos
de la UB (UBICS).

CITIZEN SCIENCE COMES OF AGE

Efforts to engage the public in research are bigger and more diverse than ever. But how much more room is there to grow?

BY AISLING IRWIN

Filip Meysman knew he had made his mark on Antwerp when he overheard commuters discussing his research project on the train. Then, just a few days later, he saw an advertisement about his work on television. There it was, he says, “in between the toothpaste and George Clooney’s Nespresso”.

As a biogeochemist at the University of Antwerp in Belgium, Meysman wasn’t used to drawing so much attention. But that was before he adopted the citizens of northern Belgium as research partners. With the help of the Flemish environmental protection agency and a regional newspaper, Meysman and a team of non-academics attracted more than 50,000 people to Curieuzeneuzen, an effort to assess the region’s air quality (the name is a play on Antwerp dialect for ‘nosy’ people).

The project ultimately distributed air-pollution samplers to 20,000 participants, who took readings for a month (see ‘Street science’). More than 99% of the sensors were returned to Meysman’s laboratory for analysis, yielding a bounty of 17,800 data points. They provided Meysman and his colleagues with information about nitrogen dioxide concentrations at ‘nose height’ — a level of the atmosphere that can’t be discerned by satellite and would be prohibitively expensive for scientists to measure on their own. “It has given us a data set which it is not possible to get by other means,” says Meysman, who models air quality.

Citizen science — active public involvement in scientific research — is growing bigger, more ambitious and more networked. Beyond monitoring pollution and snapping millions of pictures of flora and fauna, people are building Geiger counters to assess radiation levels, photographing stagnant water to help document the spread of mosquito-borne disease, and taking videos of water flow to calibrate flood models. And an increasing number are donating thinking time to help speed up meta-analyses or assess images in ways that algorithms cannot yet match.

The movement is surfing wider societal forces, including a thirst for data; the rise of connectedness and low-cost sensor technologies; and a push to improve the transparency and accessibility of science. Increasingly, government institutions and international organizations are getting in on the action. The US and Scottish environmental protection agencies, for example, have incorporated citizen science in their routine work. The United Nations Environment Programme is exploring ways of using citizen science to both monitor the environment and stoke environmental concern. And the European Commission has made a range of funding opportunities available for citizen science within its €80-billion

Japanese priest
Sadamaru Okano
stands beneath
a Geiger counter
(top left) that sends
radiation readings to
the Safecast project.

BEHROUZ MEHR/AFP/GETTY

480 | NATURE | VOL 562 | 25 OCTOBER 2018

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Irwin, Aisling (2018). CITIZEN SCIENCE COMES OF AGE. Nature, 562(7728), 480–482.



The CoAct project has received funding from the European Union’s Horizon 2020 Research and Innovation programme under grant agreement No. 873048



Ciencia compartida – Nature, Octubre 2018

NEWS FEATURE

PARTNERS IN SCIENCE

The people who should benefit from research are increasingly shaping how it is done.

BY CASSANDRA WILLYARD, MEGAN SCUDELLARI AND LINDA NORDLING

Valarie Blue Bird Jernigan knew she had to tweak some standard scientific practices when she started her latest research project. One of the first things to go was the usual concept of a control group — people who would not receive interventions to encourage healthy eating. That wouldn't be fair to the people of the Osage Nation, a Native American people in northeastern Oklahoma.

Another concept to ditch was the idea that she was studying a group at all. Jernigan, a public-health researcher, who is Native American herself, has treated the Osage people as equal partners from the first day of the project. It took two years and seemingly endless rounds of community discussions to get the study off the ground, but Jernigan wouldn't have had it any other way. This kind of research "isn't just about proving your hypothesis," she says. It's more about improving people's lives and, at the same time, helping them gain the skills to do science.

Jernigan's approach, often referred to as community-based participatory research, has been gaining traction for the past two decades. It has become particularly important for research that involves indigenous and other populations who have been mistreated by scientists in the past. The Havasupai tribe in Arizona, for example, waged a lengthy legal battle with Arizona State University in Phoenix over researchers' misuse of blood samples that the tribe had provided for a diabetes study in the 1990s. The samples were eventually returned as part of a settlement two decades later. The lessons learnt from the event have set the tone for how best to do research involving Native Americans.

Community participation has become the norm. "In minority communities, it's probably the primary research methodology," says public-health researcher Alexandria Adams, director of the Center for American Indian and Rural Health Equity at Montana State University in Bozeman. "It reduces mistrust, it improves dissemination and it improves cooperation." The goal of such efforts is the co-production of research, in which the stakeholders who are supposed to benefit from a strand of research become active partners in conducting it. Scientists from disciplines as varied as archaeology, public health and climate change have embraced the approach, working with community members on many different aspects, from formulating study questions and design, to doing experiments and analysing and reporting results.

Nature talked to three groups that have built successful co-produced projects. Their experiences reveal the challenges and rewards that come with the open and collaborative exchange of ideas. The work veers away from the standard outputs of science, such as talks and papers, and expands the idea of what it means to be a scientist and a collaborator.



A PLACE AT THE TABLE
Jernigan's latest project with the Osage people wasn't wholly her idea. It started with Raymond Red Corn. As a child growing up in the Osage Nation, Red Corn helped his parents to harvest the dusky red ears of maize (corn) and process them into corn soup and hominy, a food made from soaking kernels in lye or wood ash until they go puffy. Taking the maize from seed to soup is something the Osage have done for centuries. But that tradition has nearly disappeared. "I couldn't hardly find anyone younger than me that had ever done it, even in the most traditional families," he says.

Four years ago, Red Corn was elected assistant chief of the Osage Nation. Right away, he started looking for a spot to plant traditional maize and other crops. Fresh fruit and vegetables are hard to come by in Osage County. Since the 1970s, the Osage people have increasingly relied on canned and processed foods that are high in salt, fat and sugar.

Red Corn wants to see the community take back control of its food supply. By restoring their connection to the land and its lost food traditions, he thinks, they just might be able to revitalize a healthier lifestyle. The efforts might even help to tackle the high rates of obesity and diabetes in Native Americans in the area. In the Osage Nation, "everything we do revolves around food," Red Corn says. "You can't heal the community unless you heal the food system."



"YOU NEVER ASK SOMETHING OF SOMEONE WITHOUT GIVING THEM SOMETHING BACK."

Research on marginalized groups can be fraught, and working with tribal communities is especially complicated. A history of research abuses has left many Native Americans

is a member of the Choctaw Nation. Jernigan has spent the bulk of her career testing strategies to improve the food environment on reservations as a way to enhance health. She has another project with two other Native American communities in Oklahoma to get healthier foods into their convenience stores.

CO-PRODUCTION OF RESEARCH
A Nature special issue
[nature.com/collections/coproductio](https://www.nature.com/collections/coproductio)

Researchers excavate an ancient cattle pen for the Mambo Archaeological Project.

mistrustful of the scientific enterprise. In the past, investigators have used tribal members as unwitting participants in unethical and dangerous experiments. And, as in the Havasupai case, scientists have at times withheld information from the communities they have studied and largely ignored tribal concerns.

When Native Americans think of health studies, they often think of "helicopter researchers", Jernigan says — scientists who fly in, collect data and blood samples, and then leave. "And they never see one benefit." What's more, working with indigenous communities means dealing with sovereign governments, some of which have their own institutional review boards. "You have to go through all these extra layers of protections," Jernigan says. These days, collaboration and co-production aren't just ethical, they are mandatory. "There's almost no other way of doing it," she says.

As a first step, Jernigan proposed launching a pilot study to work out what the community actually wanted. The team surveyed everyone from community members to leadership, and found that people seemed most interested in the idea of community gardening. They wanted to use locally grown crops to help supply some of the tribally run programmes for children and older people.

But boosting the supply of fresh fruit and vegetables is only half the battle: people also wanted to increase the desire for healthy foods. So Jernigan worked with the Osage to design a community programme aimed at getting young children and their families to eat more fruit and vegetables. The trial, called Food Resource Equity and Sustainability for Health, or FRESH, launched in January. The team came up with new, healthier menus for a programme that provides care for children aged 3–5 from low-income backgrounds.

The researchers also provided the schools with demonstration gardens. Each week, the teachers spend 90 minutes telling stories about food, working with the children in the garden, and conducting a simple cooking lesson. On Fridays, the children take home a healthy meal kit to prepare with their families. Meanwhile, their parents take part in a 15-week online workshop.

The cultural elements are important. Parents are encouraged to attend a monthly family night, where they talk about foods they remember eating when they were young, what they eat now, where it comes from and why they choose certain foods. Jernigan's team has given video cameras to families to record their own food stories. "There's a lot of realization about

FEATURE NEWS



Science shared

Those who were once the subjects of scientific enquiry are increasingly in the driver's seat. A special issue explores the co-production of research.

From people with HIV selecting which trials of antiviral therapies get funded, to farmers of smallholdings guiding weather monitoring, the people affected by research are increasingly getting involved in it. They are shaping how projects are conceived, supported, done, assessed, disseminated and rated. They are partners in research production.

This special issue looks at the promise and the pitfalls of co-production for the stakeholders, scientists and societies now working shoulder to shoulder. As one advocate describes it: "It's about getting everybody round the table so you're valuing the knowledge everybody has."

A series of case studies on page 24 illustrates the many forms such research can take. They include a public-health researcher who has been working to curb childhood obesity with members of the Osage Nation, a Native American community in Oklahoma, and climate modellers embedded with city planners in nine southern African cities to help determine the research and infrastructure needed to adapt to climate change. The stories highlight common themes: co-production takes people out of their comfort zones, but the pay-off comes in the form of enhanced trust

and communication. Importantly, the research has a much better chance of making a difference to the people involved.

Those who were previously outside the academic system are also becoming gatekeepers for research: helping to decide what gets funded, published and evaluated. A collection of Comment articles describes how patients and carers are invited to review manuscripts at *The BMJ* (see page 30) and grant applications at the California Institute for Regenerative Medicine (see page 31). In some cases, they encourage risk-taking, in others, they rein in false hope. Another article calls for the wider use of co-created evaluation tools to improve and incentivize research co-production (see page 32).

So how do you join the revolution? Public-involvement manager Gary Hickey offers five principles for co-producing research on page 29. Chief among these is to share power. But, as he writes, co-production won't happen just because it is a good thing: research partners need to change their practices and cultures. Getting everybody around the table is worthwhile, but it takes work. ■

CO-PRODUCTION OF RESEARCH
A Nature special issue
[nature.com/collections/coproductio](https://www.nature.com/collections/coproductio)

<https://www.nature.com/articles/d41586-018-06859-3>



The CoAct project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No. 873048

¿La colaboración es la respuesta pero cuál es la pregunta?

Hans Ulrich Obrist, Serpentine Gallery, London.



The CoAct project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No. 873048

Ciencia ciudadana – Epistemological viewpoint

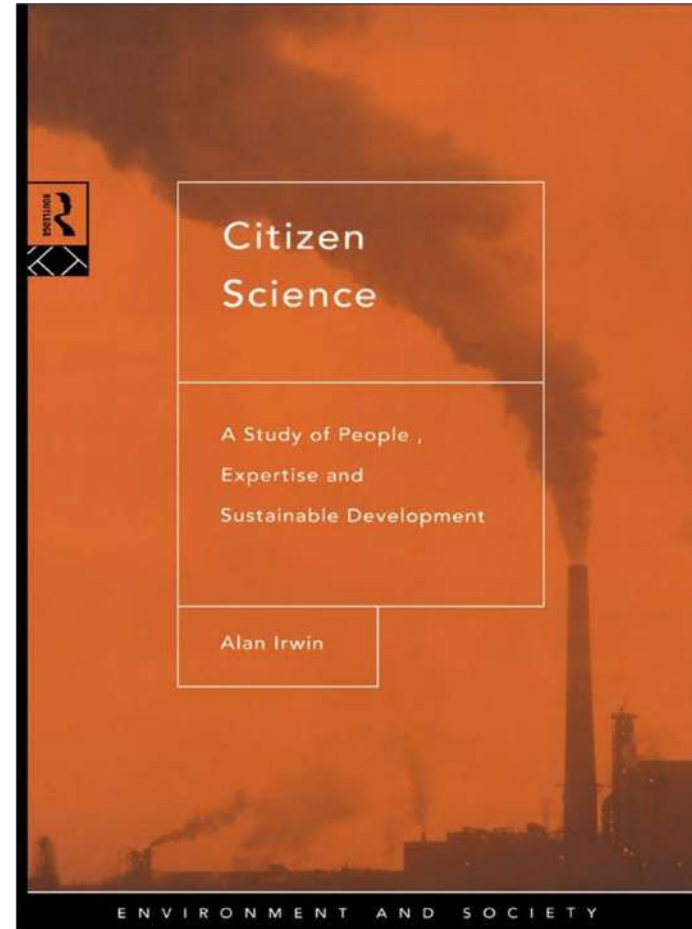
La ciencia [ciudadana]...

“[...] atiende las necesidades e inquietudes de los ciudadanos”

“una forma de ciencia desarrollada y promulgada por los propios ciudadanos”

Irwin (1995)

Irwin, A. (1995). Citizen science: A study of people, expertise and sustainable development. Routledge Press.



”

Lo social no es una parte de la realidad que pueda separarse de manera significativa; en cambio, es un principio de conexión, asociación y relación.

”

M. Gross when talking about B Latour and the notion of collective experiments. Matthias Gross (2010) The Public Proceduralization of Contingency: Bruno Latour and the Formation of Collective Experiments, Social Epistemology, 24:1, 63-74, DOI:10.1080/02691721003632826





Cuál es la
“**dimensión
social**” de
la ciencia
ciudadana?

Qué hay de
“**social**” en
la ciencia
ciudadana?



Ciencia ciudadana social en CoAct

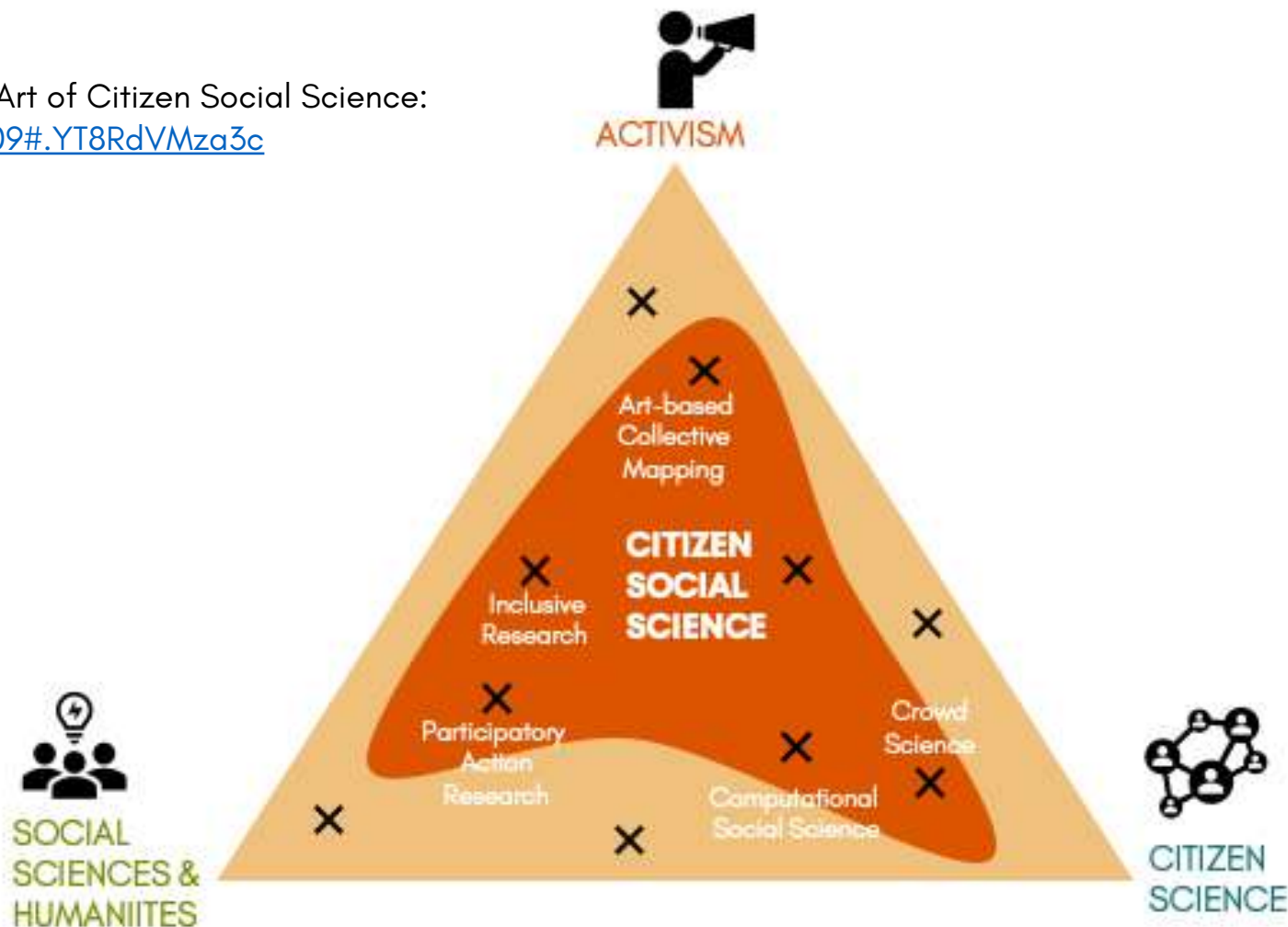
Investigación participativa codiseñada e impulsada directamente por grupos de ciudadanos que comparten una preocupación social.



Ciencia ciudadana social

CoActD2.1: Report on State of the Art of Citizen Social Science:

<https://zenodo.org/record/4810909#.YT8RdVMza3c>



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Actores principales en CoAct



Co-Investigadoras: personas que tienen una experiencia vivida en relación con las preocupaciones sociales y, por lo tanto, están reconocidas como expertas. Copropietarias de los datos y resultados de la investigación.



Datos y conocimiento

Del experimento a la
experiencia

Coproducción

Conocimiento accionable

Social

Temas socialmente robustos

Colaboración y cooperación

Contextos y sitios



Ciencia ciudadana social en CoAct



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Ciencia ciudadana social en CoAct

Inclusividad

Horizontalidad

Equidad

Confianza y
respeto

Ciencia abierta

Co-propiedad

Empoderamiento

Reflexividad

<https://coactproject.eu/our-ethical-values/>



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Ciencia ciudadana social

Albert, A., Balázs, B., Butkevičienė, E., Mayer, K., & Perelló, J. (2021). Citizen social science: new and established approaches to participation in social research. Chapter 7. In: Vohland K. et al.(Eds). 2021. The Science of Citizen Science. Springer.
<https://doi.org/10.1007/978-3-030-58278-4> . pp: 119-138.

Terminología
y lenguaje



Diversidad de
intereses

Aspectos
éticos

Evaluación

Relación de
poderes



Políticas, acción
ciudadana

Experiencia
en sociedad

Espacios
culturales

Redes de
apoyo

Inclusión
social

Educación

Ciencia
ciudadana
academica

Estació Ciutat: xAire

StemForYouth y experimentos públicos

Ciència i Acció Ciutadana

CoActuem per la Salut Mental

Mobilidad humana

Dilema R - Transform

Estació Ciutat



Natalie Jeremijenko and Amanda Masha-Camins. Centre de Cultura Contemporània de Barcelona, 2017. Coproduction with CCCB, Institut de Cultura de Barcelona, Àrea d'Ecologia, Urbanisme i Mobilitat de l'Ajuntament de Barcelona, Districte de Sant Martí. Con Taula Eix Pere IV.

xAire: NO2 en Barcelona

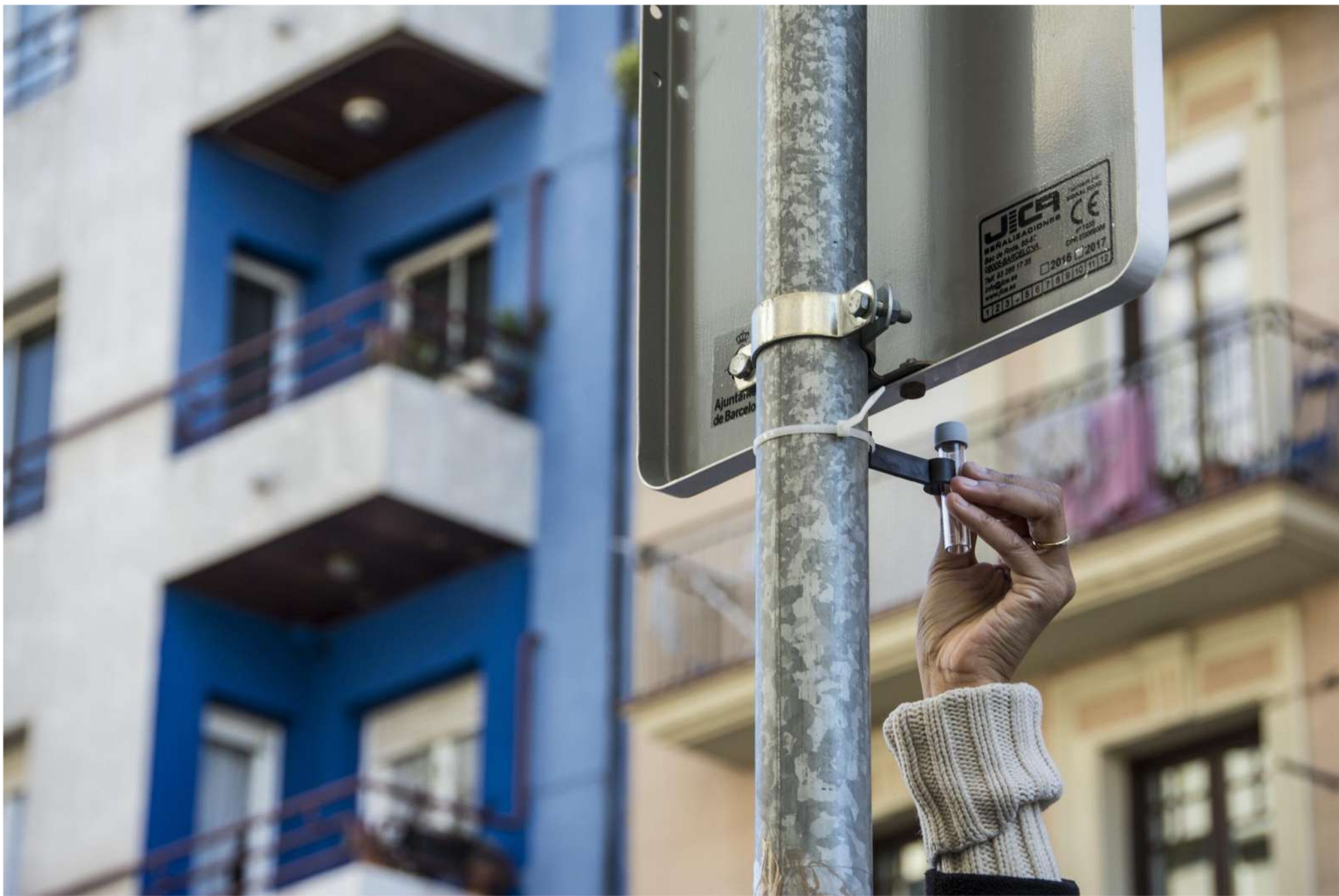


A Barcelona hi ha set estacions que fan mesuraments automàtics del diòxid de nitrogen (NO₂). Les dades es consoliden cada hora (mitjana horària) i, una vegada validades pel Departament de Territori i Sostenibilitat de la Generalitat de Catalunya, es mostren al web de Qualitat de L'Aire de l'Ajuntament. Un bot publica automàticament aquest tuit cada 4 hores.

WHO 2021 AQG levels

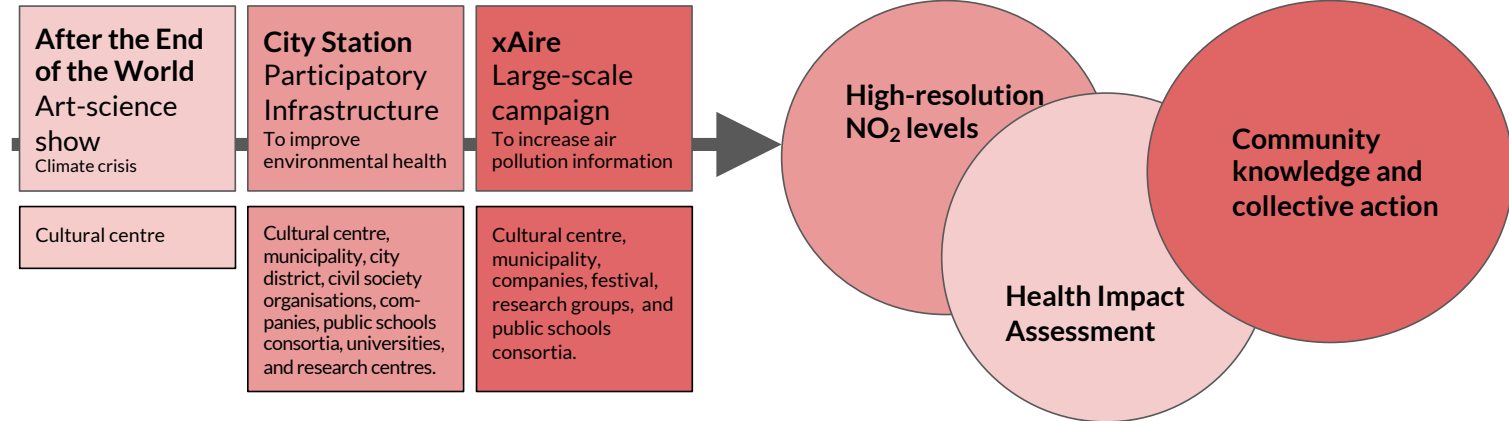
Pollutant	Averaging Time	2005 AQGs	2021 AQGs
PM_{2.5} µg/m ³	Annual	10	5 ↓
	24-hour	25	15 ↓
PM₁₀ µg/m ³	Annual	20	15 ↓
	24-hour	50	45 ↓
O₃ µg/m ³	Peak season	-	60
	8-hour	100	100
NO₂ µg/m ³	Annual	40	10 ↓
	24-hour	-	25
SO₂ µg/m ³	24-hour	20	40 ↑
CO mg/m ³	24-hour	-	4



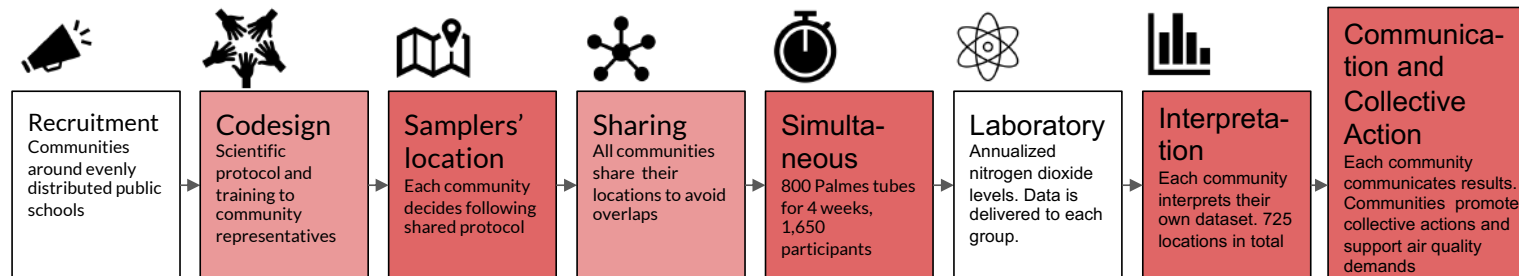


xAire: NO₂ in Barcelona

Context and inception



Participatory research process



Perelló, J., Cigarini, A., Vicens, J., Bonhoure, I., Rojas-Rueda, D., Nieuwenhuijsen, M. J., ... & Ripoll, A. (2021). Large-scale citizen science provides high-resolution nitrogen dioxide values and health impact while enhancing community knowledge and collective action. *Science of The Total Environment*, 789, 147750.

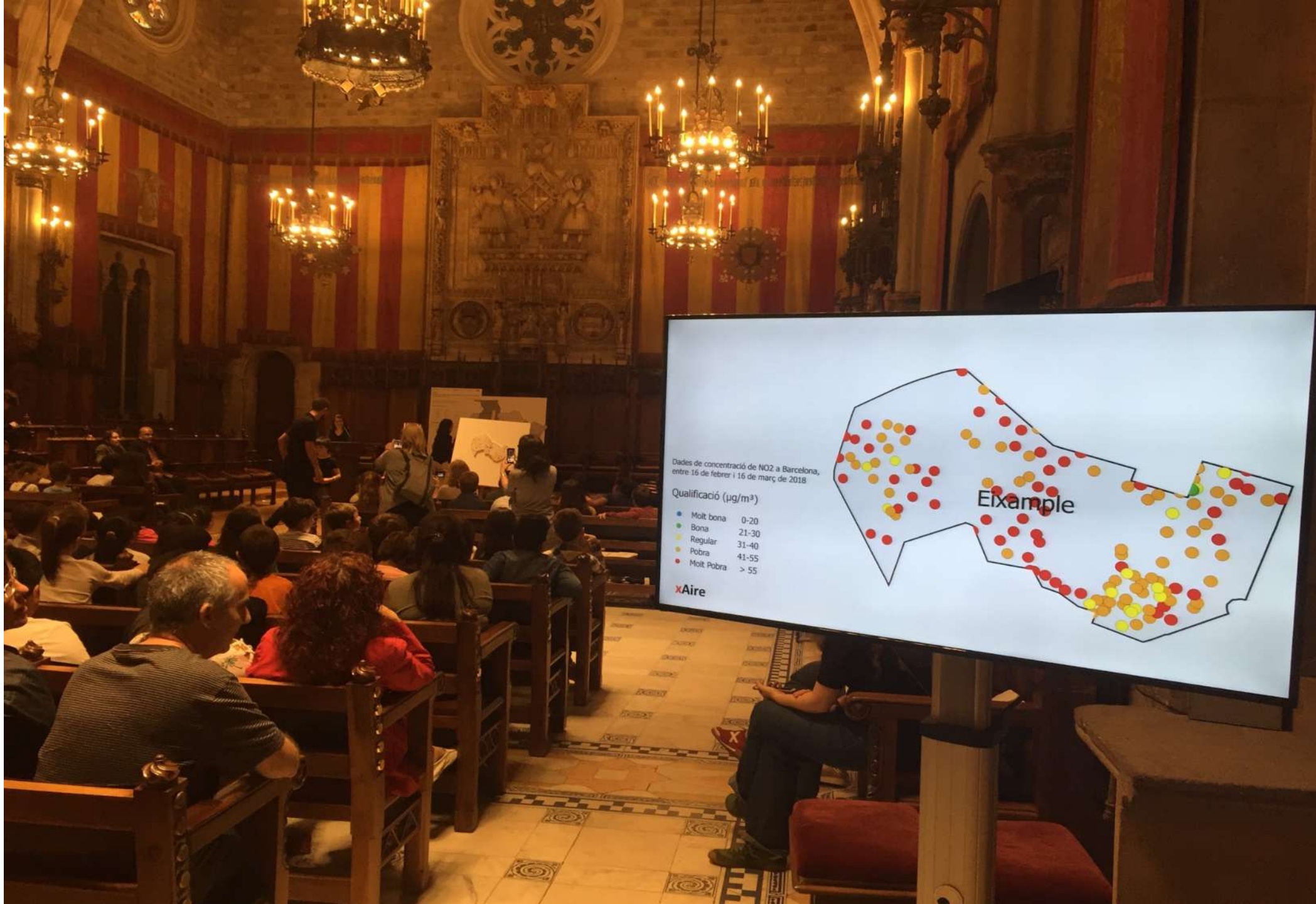


xAire: NO₂ en Barcelona



Los datos y su recogida como un proceso de diálogo y conversación.

+800 tubos para medir la concentración mensual de NO₂. Instalados por toda la ciudad por parte de familias, docentes y alumnado (+1.500 personas implicadas). Todos con el mismo protocolo pero con la libertad de medir en sus propios lugares.



Dades de concentració de NO₂ a Barcelona,
entre 16 de febrer i 16 de març de 2018

Qualificació (µg/m³)

- Molt bona 0-20
- Bona 21-30
- Regular 31-40
- Pobra 41-55
- Molt Pobra > 55

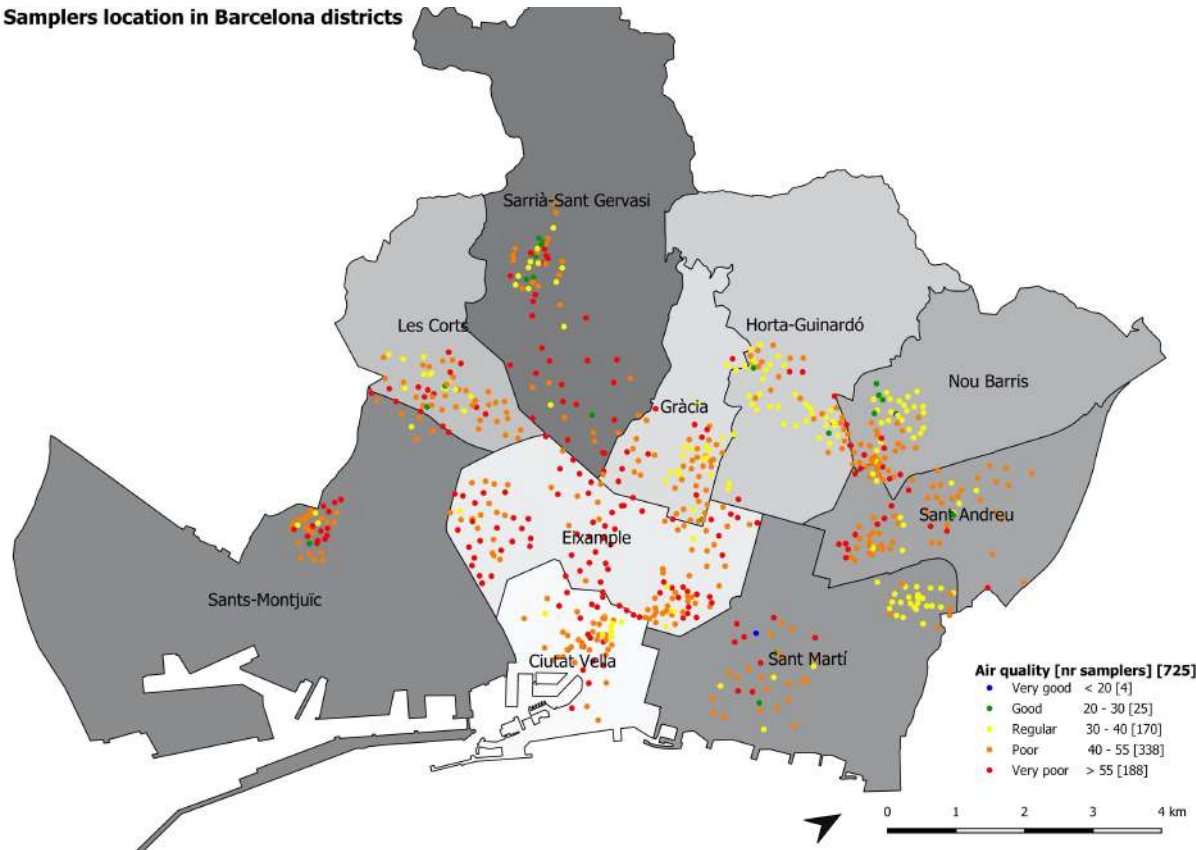
xAire

Eixample

xAire: NO₂ en Barcelona



Samplers location in Barcelona districts



Perelló, J., Cigarini, A., Vicens, J., Bonhoure, I., Rojas-Rueda, D., Nieuwenhuijsen, M. J., ... & Ripoll, A. (2021). Large-scale citizen science provides high-resolution nitrogen dioxide values and health impact while enhancing community knowledge and collective action. *Science of The Total Environment*, 789, 147750. <https://doi.org/10.1016/j.scitotenv.2021.147750>

xAire: NO2 en Barcelona



Perelló, J., Cigarini, A., Vicens, J., Bonhoure, I., Rojas-Rueda, D., Nieuwenhuijsen, M. J., ... & Ripoll, A. (2021). Large-scale citizen science provides high-resolution nitrogen dioxide values and health impact while enhancing community knowledge and collective action. *Science of The Total Environment*, 789, 147750.

<https://doi.org/10.1016/j.scitotenv.2021.147750>

xAire: Guia d'ús per a centres educatius

<https://zenodo.org/record/3718949#.YXF0utlBzX0>

<https://doi.org/10.1016/j.mex.2021.101475> (publicación científica)

Monitoratge de la qualitat de l'aire a Barcelona – Presentación de resultados de las escuelas participantes

<https://zenodo.org/record/3699613#.YXF0ktlBzX0>

air/aria/aire
Catalonia
in Venice



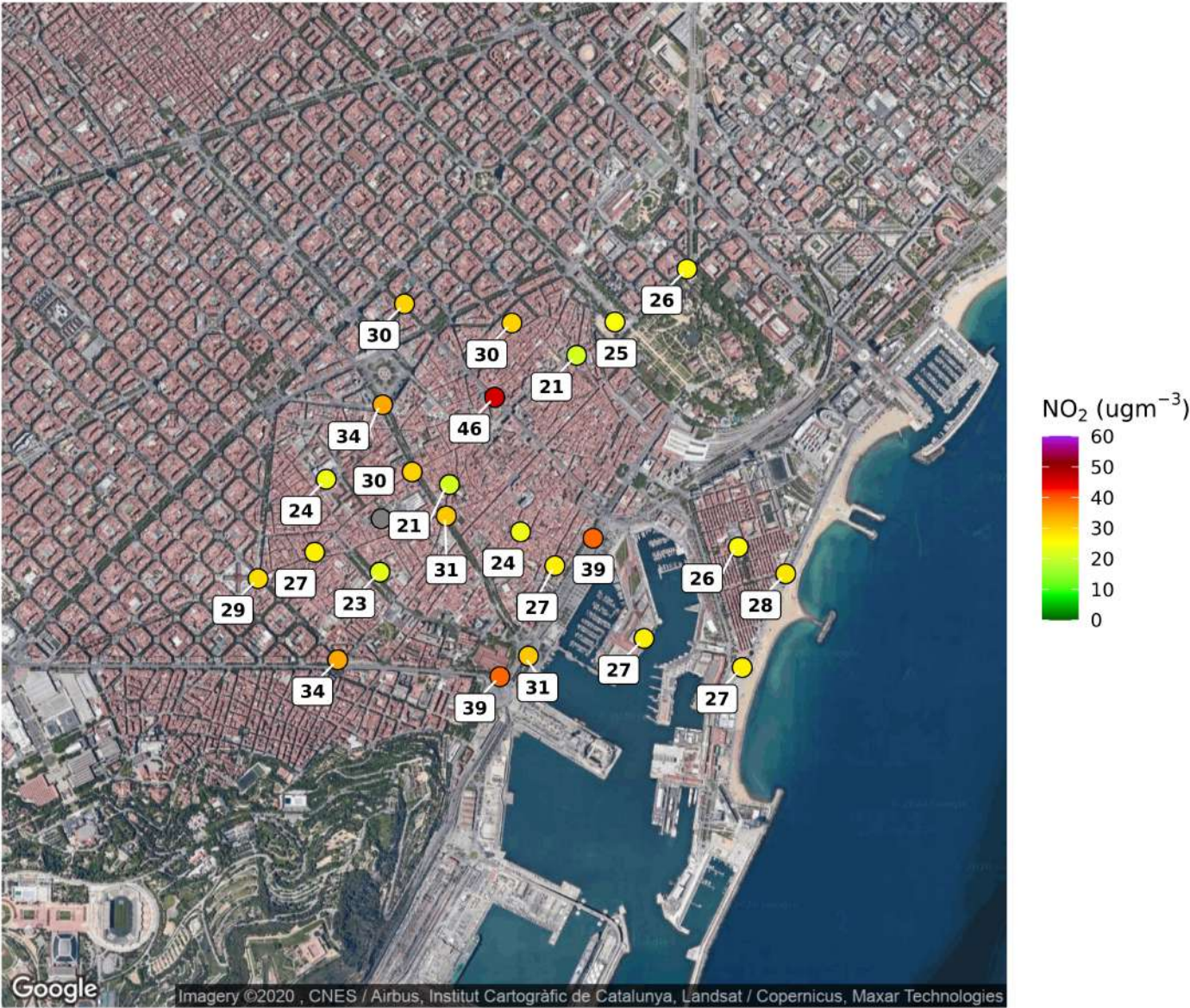
<https://www.llull.cat/monografics/air/catala/index.cfm>



air/aria/aire
Catalonia
in Venice



Concentracions de NO2



air/aria/aire
Catalonia
in Venice



air/aria/aire
Catalonia
in Venice



Estació Ciutat: xAire

StemForYouth y experimentos públicos

Ciència i Acció Ciutadana

CoActuem per la Salut Mental

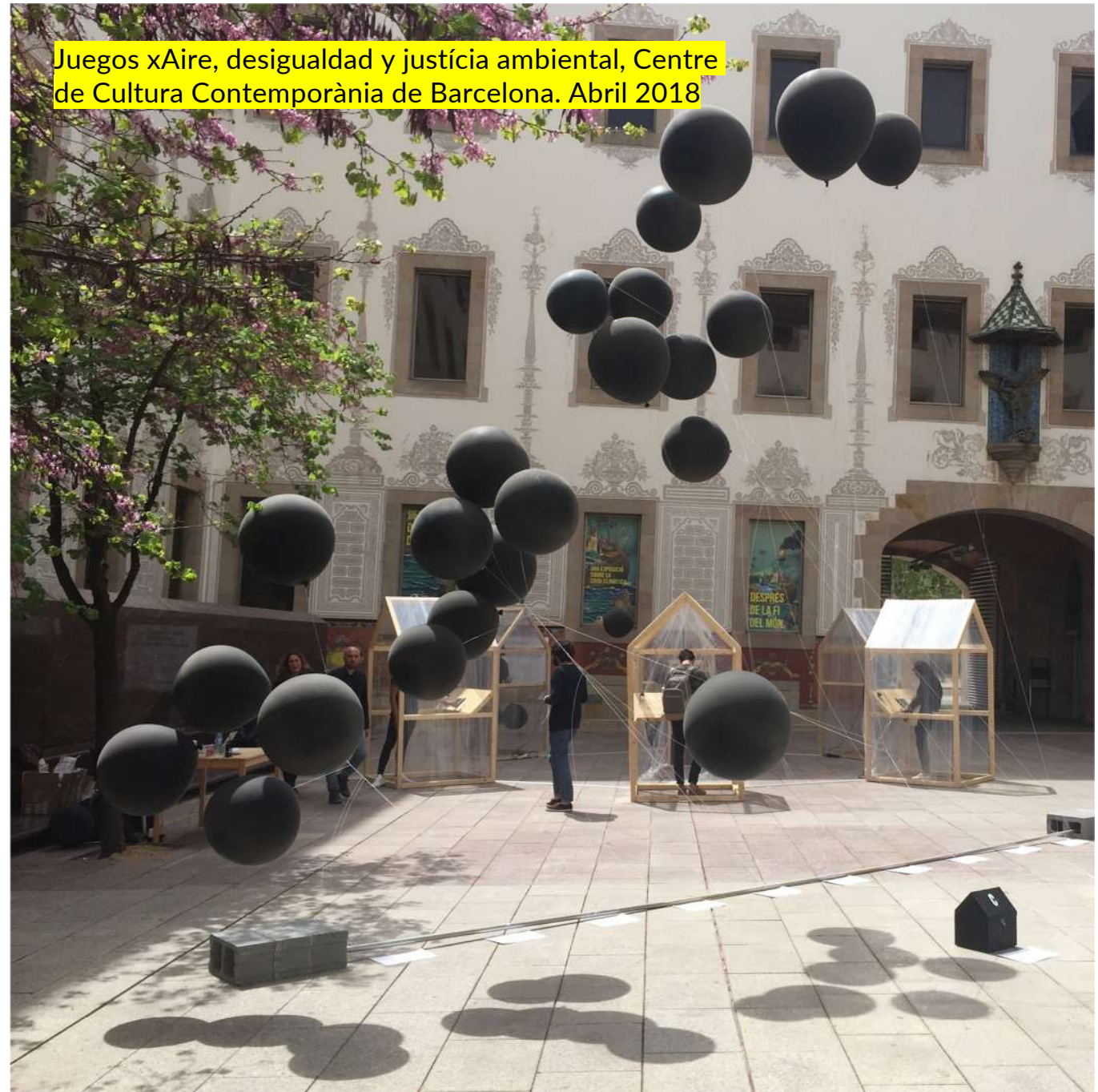
Mobilidad humana

Dilema R - Transform

Juegos xAire, desigualdad y justicia ambiental, Centre de Cultura Contemporània de Barcelona. Abril 2018

Roberto Bolaño, 2666

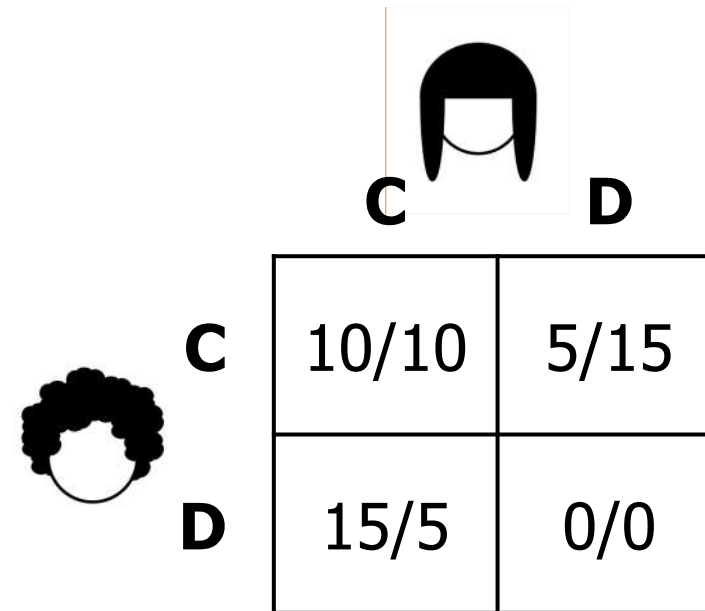
Cada cien metros el mundo cambia.



HUMAN BEHAVIOUR EXPERIMENTS

Social dilemmas: Tension between personal and collective interests.

Strategic decisions to measure diverse social behavioral traits.
Extensive palette of games.



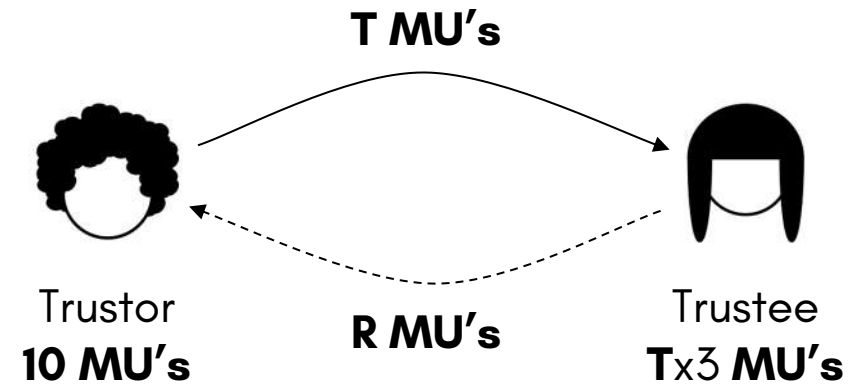
	C	D
C	10/10	5/15
D	15/5	0/0

- 1. Optimism**, choose which action (**C**ooperate or **D**efect) do you expect from the other.
- 2. Cooperation**, choose **C**ooperate or **D**efect with the other.



Social dilemmas: Tension between personal and collective interests.

Strategic decisions to measure diverse social behavioral traits.
Extensive palette of games.



$$\text{Payoff} = 10 - T + R$$

$$\text{Payoff} = T \times 3 - R$$

- 1. Trust:** send some amount of money T to an anonymous player
- 2. Reciprocity:** give some amount of the now-tripled money R back to the first player





The CoAct project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No. 873048

Mr. BANK\$ El joc de la borsa



Durant el DAU Barcelona 2013, prosseguim amb els nostres experiments de ciència ciutadana i volem conèixer com prenem decisions a través d'un joc.

Mr. Banks et repta a endevinar si el preu de la borsa pujarà o baixarà. Mr. Banks no t'ho posarà gens fàcil. Si endevines les pujades i las baixades, faràs caure la banca! Acceptes el repte?

L'experiment forma part de la Unitat de Ciència Ciutadana que la Direcció de Creativitat i Innovació de l'Ajuntament de Barcelona, conjuntament amb la FECYT i altres universitats està promovent a la ciutat dins el projecte Barcelona Laboratori.

VULL JUGAR

Joc creat per científics de:



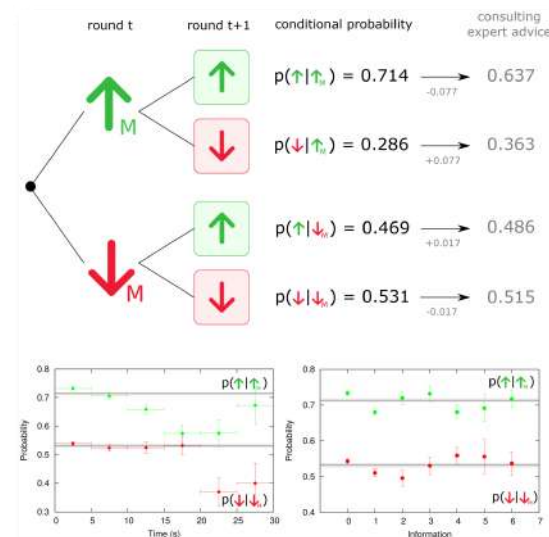
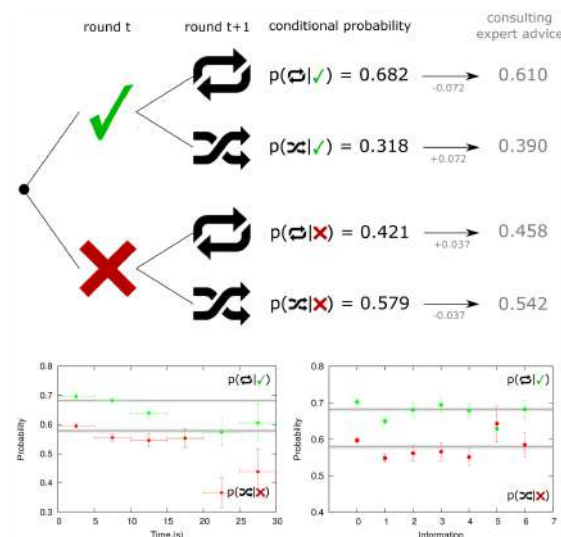
Amb el suport de:



DAU Barcelona
Board Games Festival, 2013

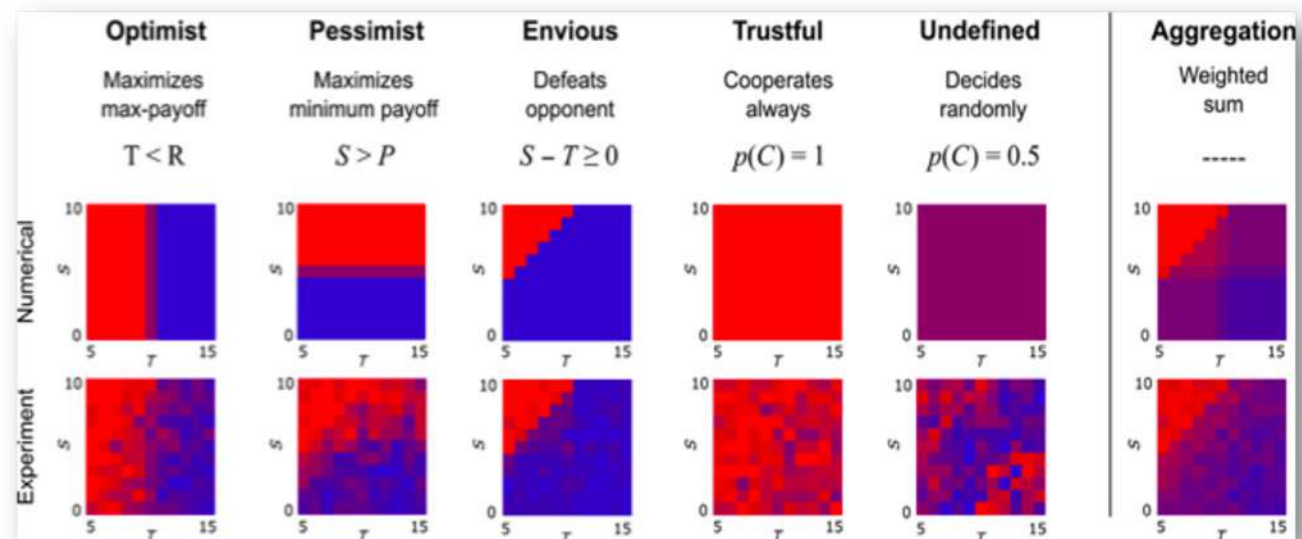


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DAU Barcelona
Board Games Festival, 2014



Poncela-Casasnovas, J., Gutiérrez-Roig, M., Gracia-Lázaro, C., Vicens, J., Gómez-Gardeñes, J., Perelló, J., ... & Sánchez, A. (2016). Humans display a reduced set of consistent behavioral phenotypes in dyadic games. *Science advances*, 2(8), e1600451.



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CAT

ESP



El joc del clima



Dr. Brain torna al DAU Barcelona! L'excèntric investigador porta els darrers mesos obsessionat amb el clima. La seva recerca, però, no acaba d'anar del tot bé i necessita de la nostra ajuda per completar-la. Ens ajudes?

Dr. Brain i els seus col·laboradors científics de quatre universitats diferents et repton per quart any consecutiu a un joc. Volen saber com prens decisions i quines són les teves decisions. T'atreveixes?

Un cop acabat el Festival DAU, rebràs per correu electrònic la teva diagnosi i una primera síntesi dels resultats científics.

VULL JUGAR!









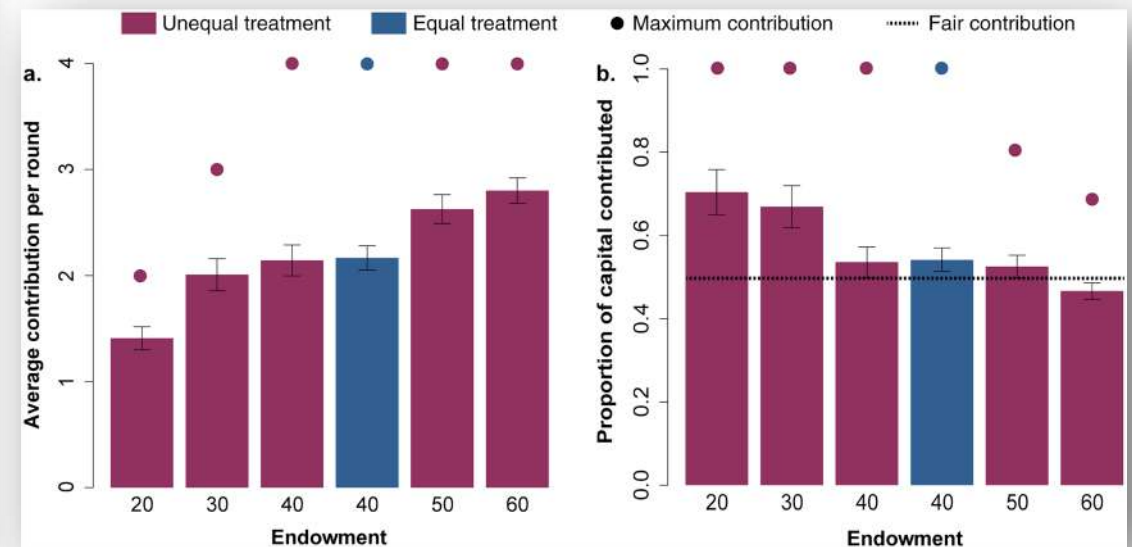








DAU Barcelona
Board Games Festival, 2015



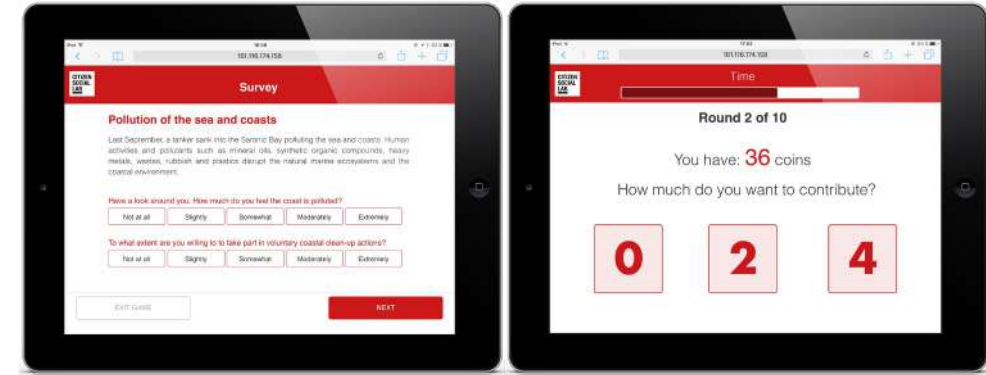
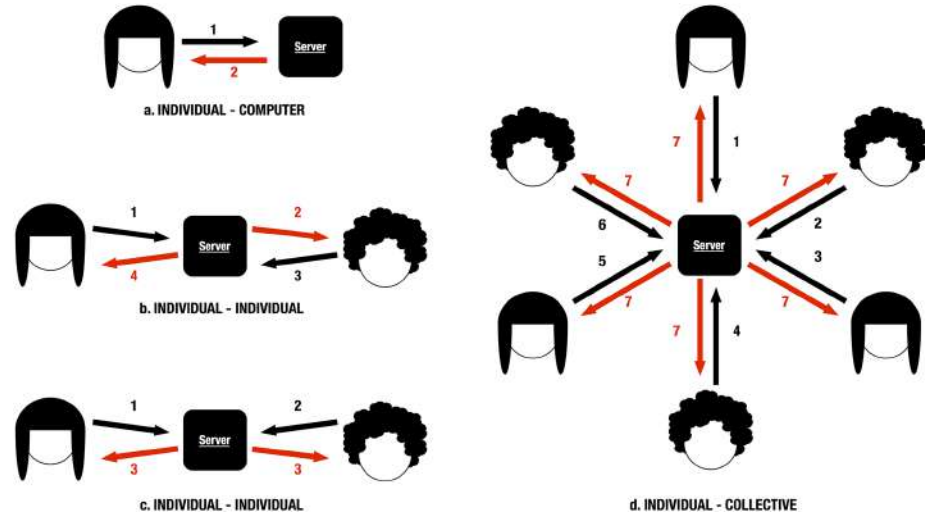
Vicens J, Bueno-Guerra N, Gutiérrez-Roig M, Gracia-Lázaro C, Gómez-Gardeñes J, Perelló J, et al. (2018) Resource heterogeneity leads to unjust effort distribution in climate change mitigation. *PLoS ONE* 13(10)



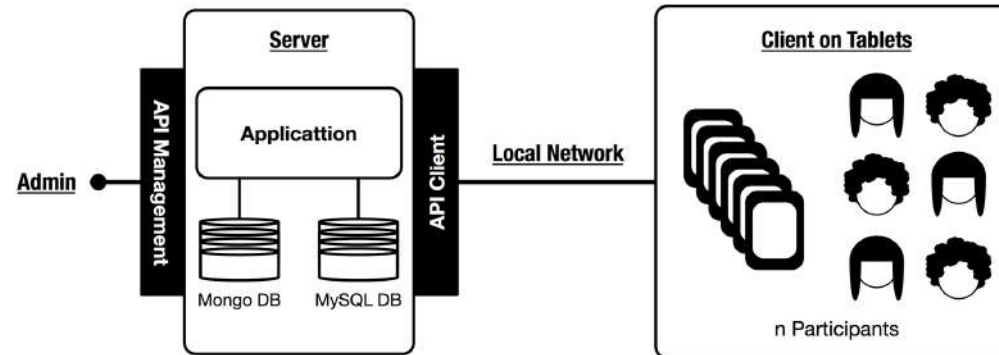
The CoAct project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No. 873048

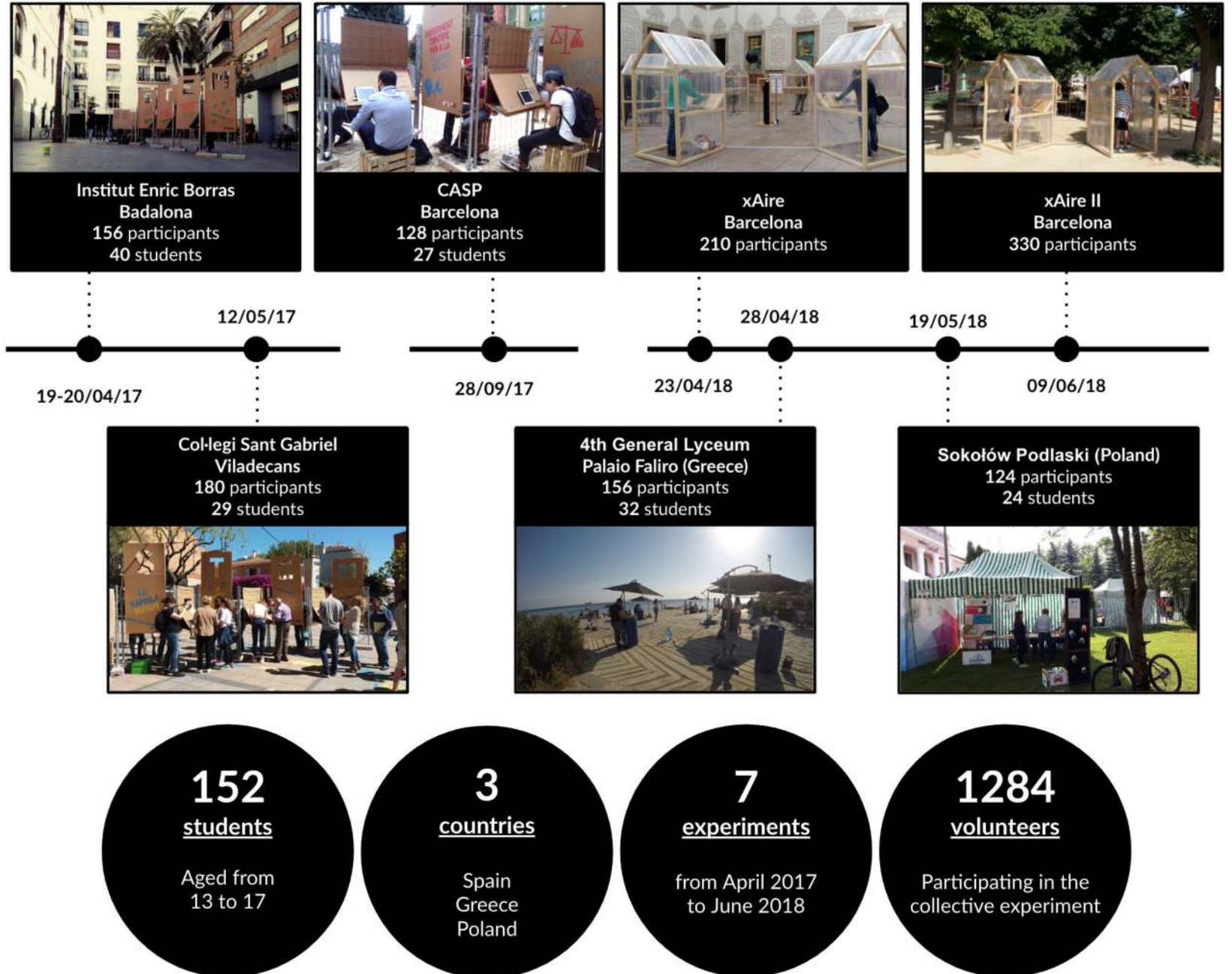
Citizen Social Lab

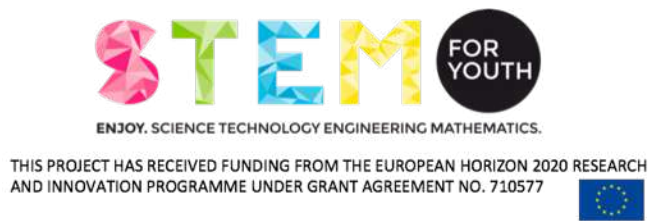
Citizens codesign the content. Games and social interactions where individual interest and collective interest are in conflict.



Vicens J, Perelló J, Duch J (2018) Citizen Social Lab: A digital platform for human behavior experimentation within a citizen science framework. *PLOS ONE* 13(12)







Juegos para el cambio social

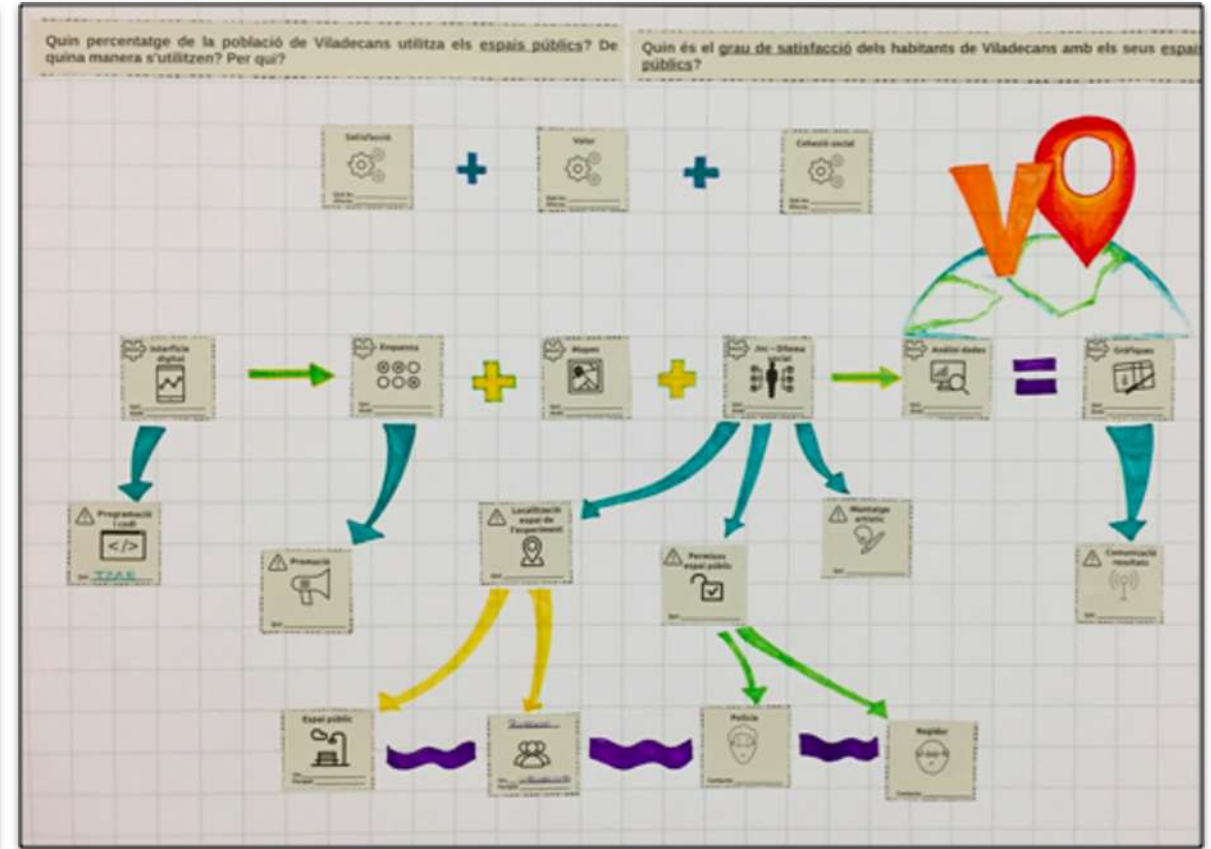
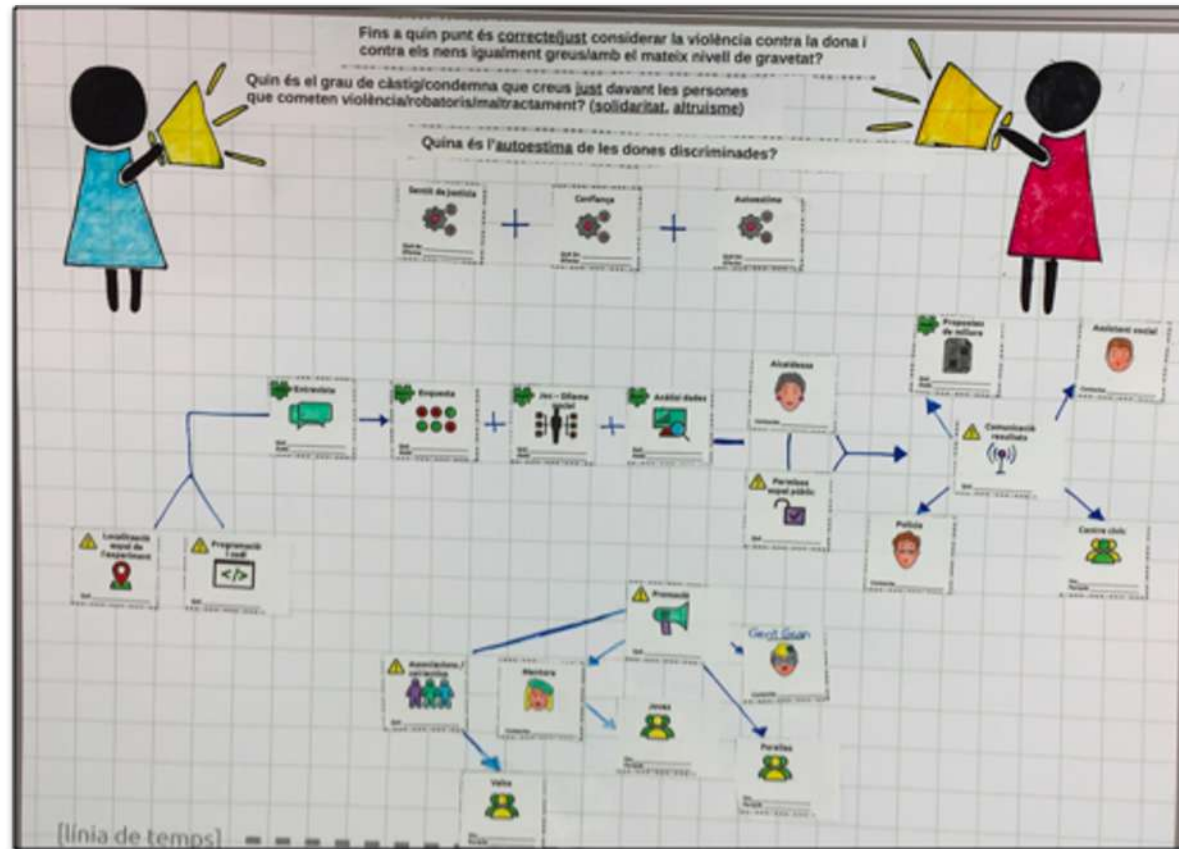
Proyecto europeo StemForYouth, tres escuelas del área metropolitana de Barcelona, Polonia y Atenas.

Aprendizaje mutuo y múltiple No hay expertos: preocupaciones locales, todo el grupo aporta sus experiencias.

Codiseño y consenso Herramientas para discutir y reflexionar colectivamente: definición y consenso para preparar experimento.

Motivación alumnado Curiosidad, investigación real, apropiación del experimento, elementos claves

Planificación final de los experimentos



Enric Senabre, Núria Ferran Ferrer, and Josep Perelló. Diseño participativo de experimentos de ciencia ciudadana. Comunicar: Revista científica iberoamericana de comunicación y educación 54 (2018): 29-38. (tb hay versión inglesa)



Enric Senabre, Núria Ferran Ferrer, and Josep Perelló. "Diseño participativo de experimentos de ciencia ciudadana." Comunicar: Revista científica iberoamericana de comunicación y educación 54 (2018): 29-38. (tb hay versión inglesa)

Urgent Estimar with Ada Vilaró and Chris Salter
Opening event in a Street Theater Festival.
FiraTàrrega
Tàrrega, September 2017



FIRA TÀRREGA
TEATRE AL CARRER



The CoAct project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No. 873048



FIRA TÀRREGA
TEATRE AL CARRER

CAct
Citizen Social Science

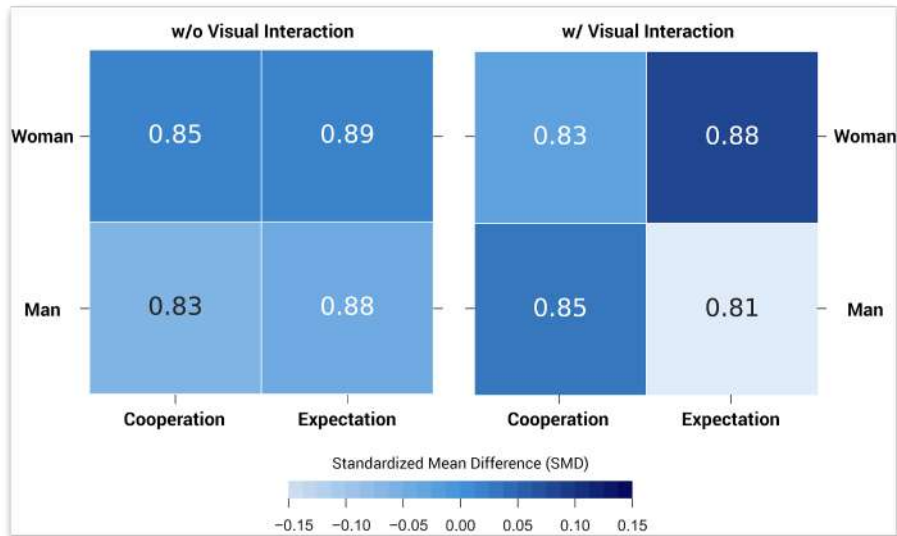
Urgent Estimar with
Ada Vilaró and
Chris Salter
Opening event in a
Street Theater
Festival.
FiraTàrrega
Tàrrega,
September 2017

Cigarini, A. Vicens, J., & Perelló J. (2020). Gender-based pairings influence cooperative expectations and behaviours. *Scientific Reports*, 10(1).

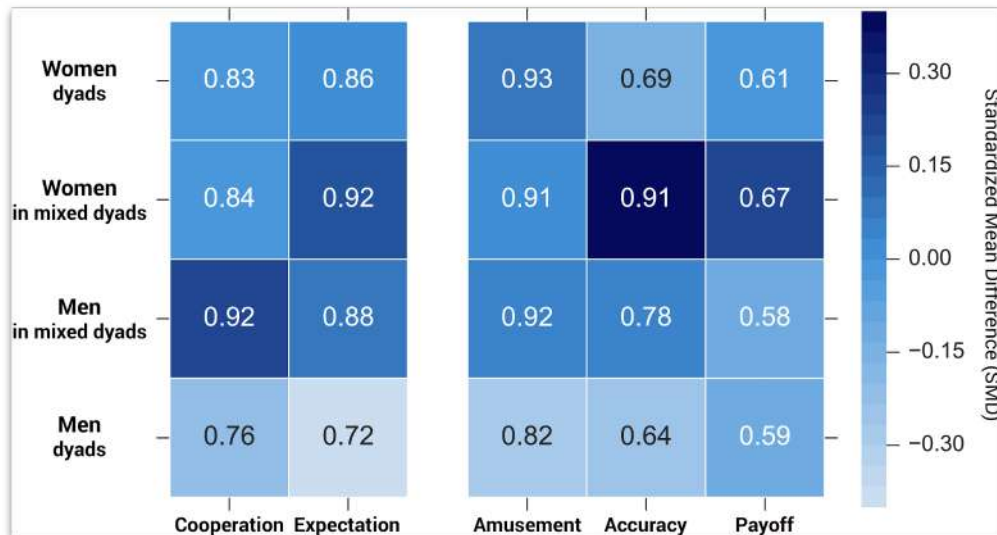


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Cigarini, A. Vicens, J., & Perelló J. (2020). Gender-based pairings influence cooperative expectations and behaviours. *Scientific Reports*, 10(1).



Urgent Estimar
Opening event in a Street
Theater Festival. FiraTàrrrega
Tàrrrega, September 2017



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ConsCIÈNCIES a la
plaça. Violences in
public space (gender
perspective).
Science Biennale 11 Feb
2019. In collaboration
with municipality, NUS
Theatre Coop and
Elisava Design School

Foto: Thomas Vilhelm



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ConsCIÈNCIES a la plaça. Violences in public space (gender perspective).

Science Biennale 11 Feb 2019. In collaboration with municipality, NUS Theatre Coop and Elisava Design School

Foto: Thomas Vilhelm



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Roberto Bolaño, 2666

En una palabra: lo mejor es la experiencia. No le diré que la experiencia no se obtenga en el trato constante con una biblioteca, pero por encima de la biblioteca prevalece la experiencia.

Proyecto StemForYouth, experimento sobre la contaminación de la costa, Atenas 2017



Estació Ciutat: xAire

StemForYouth y experimentos públicos

Ciència i Acció Ciutadana

CoActuem per la Salut Mental

Mobilidad humana

Dilema R - Transform

Bibliolab - Ciència i Acció Ciutadana



Plaça Fort Pienc, Barcelona.
Maig de 2019

Colaboración entre profesionales de las bibliotecas públicas, usuarias y entidades locales. Cocreación y realización de un experimento científico en el espacio público.

Replantear el papel de la biblioteca pública como espacio de encuentro, debate y conocimiento. Posibilidad de gestar iniciativas que tengan un impacto en el barrio o ciudad.



Diputació
Barcelona



<https://www.youtube.com/watch?v=10IdLkO2LRU>

Ciència Ciutadana a las Bibliotecas

CIÈNCIA CIUTADANA
A LES BIBLIOTEQUES

OBSERVA, ANALITZA,
CREA I PARTICIPA

OpenSystems



<https://zenodo.org/record/3490610#.XqGc1xMzafU>

Bibliolab - Ciència i Acció Ciutadana



Plaça Josep Maluquer i Salvador, Granollers.
Juny de 2019



Experimento colectivo que da voz a una inquietud surgida: Acceso a la vivienda.

Profesionales y usuarias de bibliotecas salen a la calle para interpelar al vecindario.

Estació Ciutat: xAire

StemForYouth y experimentos públicos

Ciència i Acció Ciutadana

CoActuem per la Salut Mental

Mobilidad humana

Dilema R - Transform

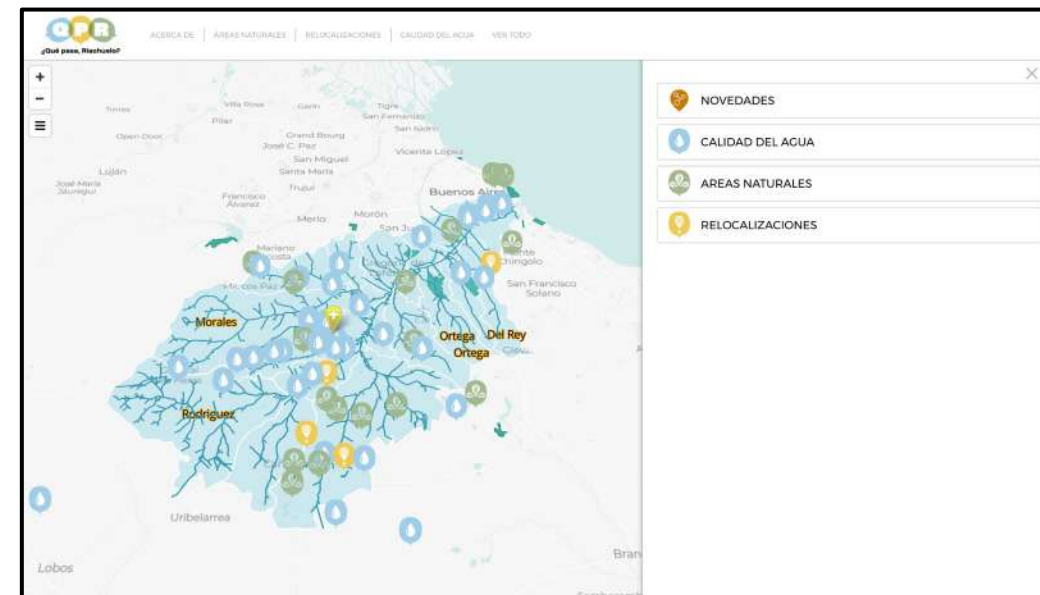
QPR: temas y objetivos

Relocalizaciones y reurbanizaciones

Calidad de agua

Áreas naturales

Novedades



- **visibilizar experiencias** de habitantes de la cuenca,
- **generar y disponibilizar información** generada colectivamente, y
- funcionar como un **canal de interacción** para la coordinación de acciones.

Cuenca Matanza-Riachuelo. Comunidades afectadas por:

- Altamente contaminada
- vulnerabilidad social
- política pública de arriba-abajo



Objetivo: promover el uso de herramientas de ciencia ciudadana social para la justicia ambiental

Co-diseño de



¿Qué pasa, Riachuelo?

Una plataforma de datos generados por la ciudadanía sobre problemas socio-ambientales

Jocs per la Salut Mental



Membres de la comunitat de salut mental col·laboren en totes les etapes, incloent el disseny de la pròpia recerca i la discussió dels resultats.

Datos para todas



Roda de premsa: OpenSystems i Federació Salut Mental Catalunya (Universitat de Barcelona, 6 de març de 2018)



Jocs X la Salut Mental: Resultats de la recerca amb Salut Mental Catalunya

Informe per la comunitat de salut mental

SCIENTIFIC REPORTS

OPEN

Quantitative account of social interactions in a mental health care ecosystem: cooperation, trust and collective action

Received: 15 November 2017
Accepted: 1 February 2018
Published online: 28 February 2018

Anna Cigarini^{1,2}, Julián Vicens^{1,2,3}, Jordi Duch^{1,4}, Angel Sánchez^{5,6,7,8} & Josep Perelló^{1,2}

Mental disorders have an enormous impact in our society, both in personal terms and in the economic costs associated with their treatment. In order to scale up services and bring down costs, administrations are starting to promote social interactions as key to care provision. We analyze quantitatively the

Publicació en una revista científica d'impacte i open-access



Sessió pública de discussió dels resultats
(Dia Mundial de la Salut Mental, Girona, 6 d'octubre de 2018)

Ciencia ciudadana social en CoAct

Investigación participativa codiseñada e impulsada directamente por grupos de ciudadanos que comparten una preocupación social.





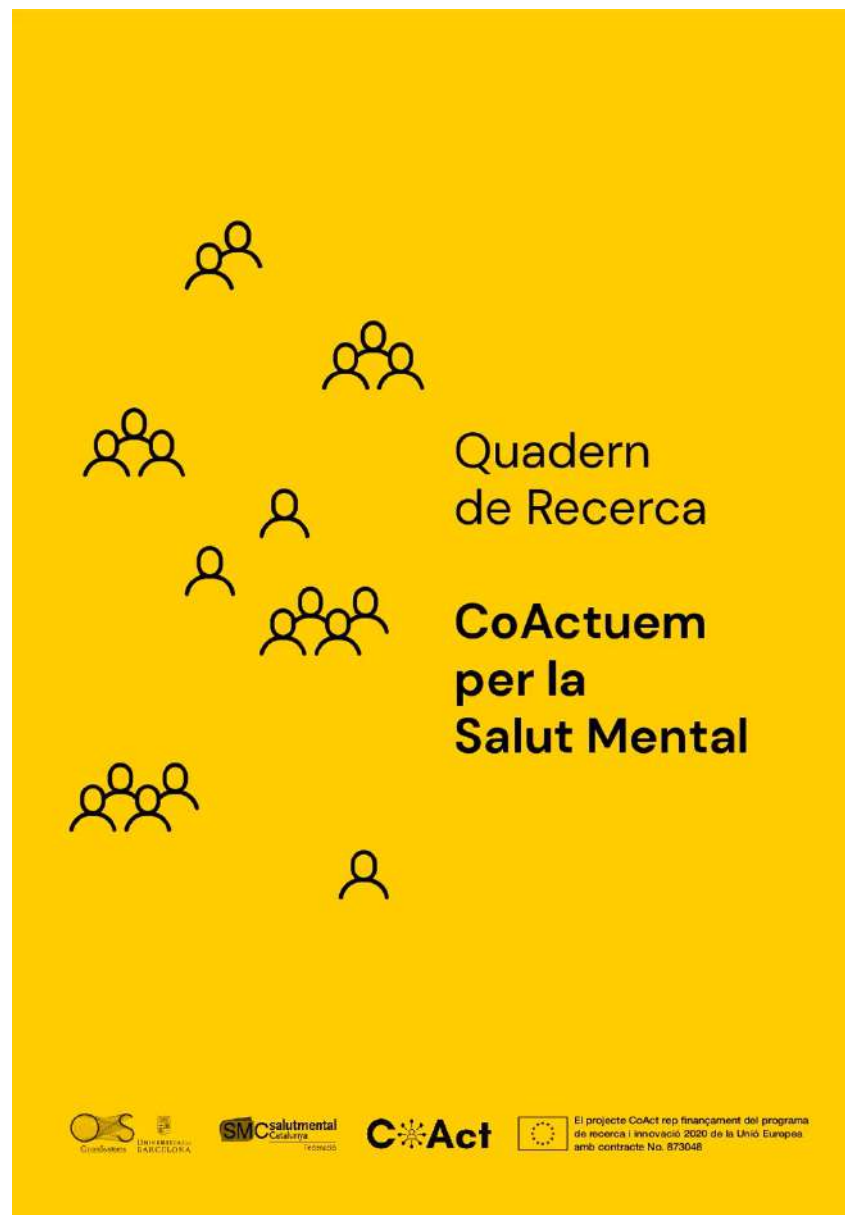
CoActuem per la Salut Mental. Dibuix: Pau Badia

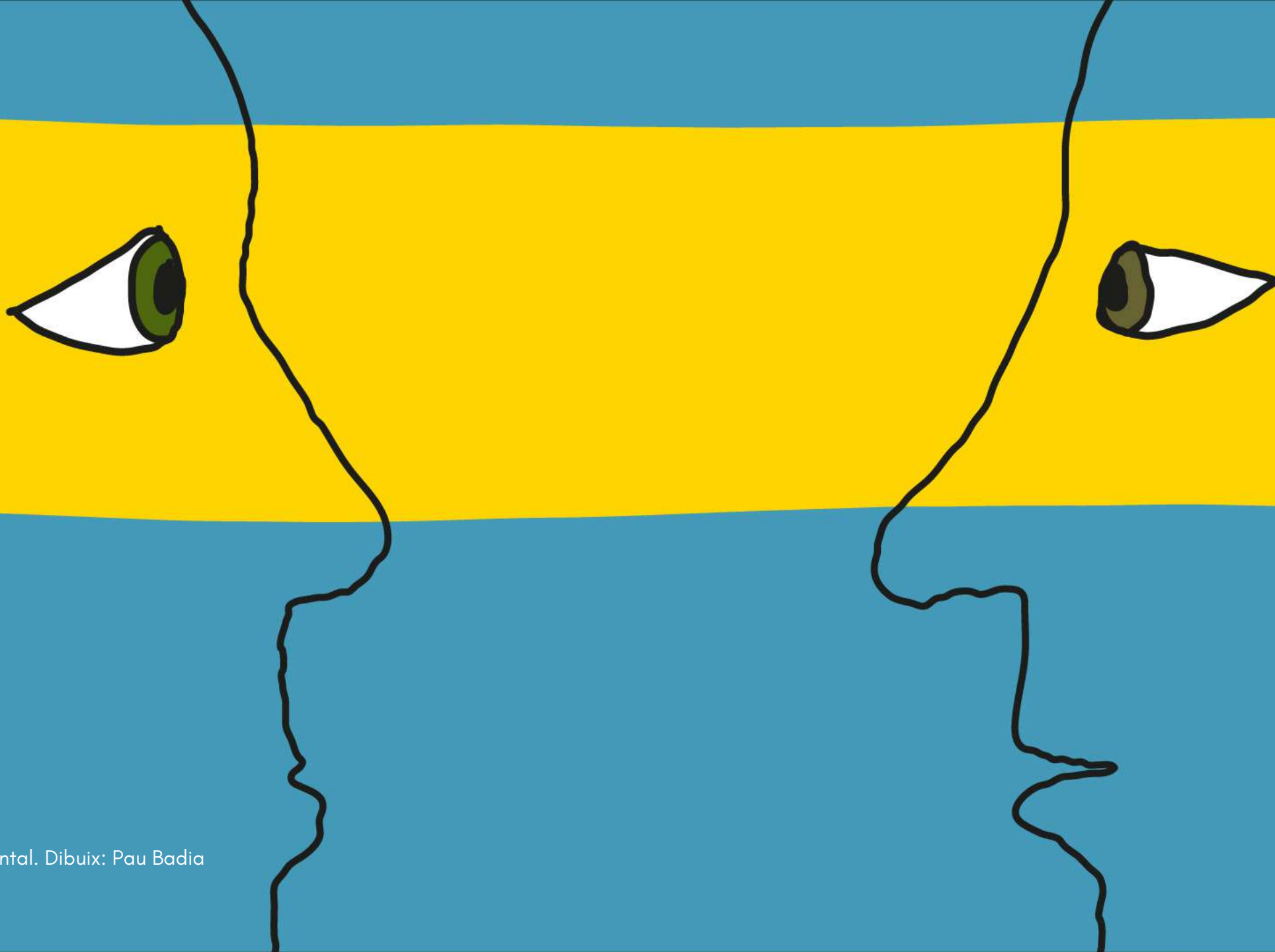


Codiseño de la investigación

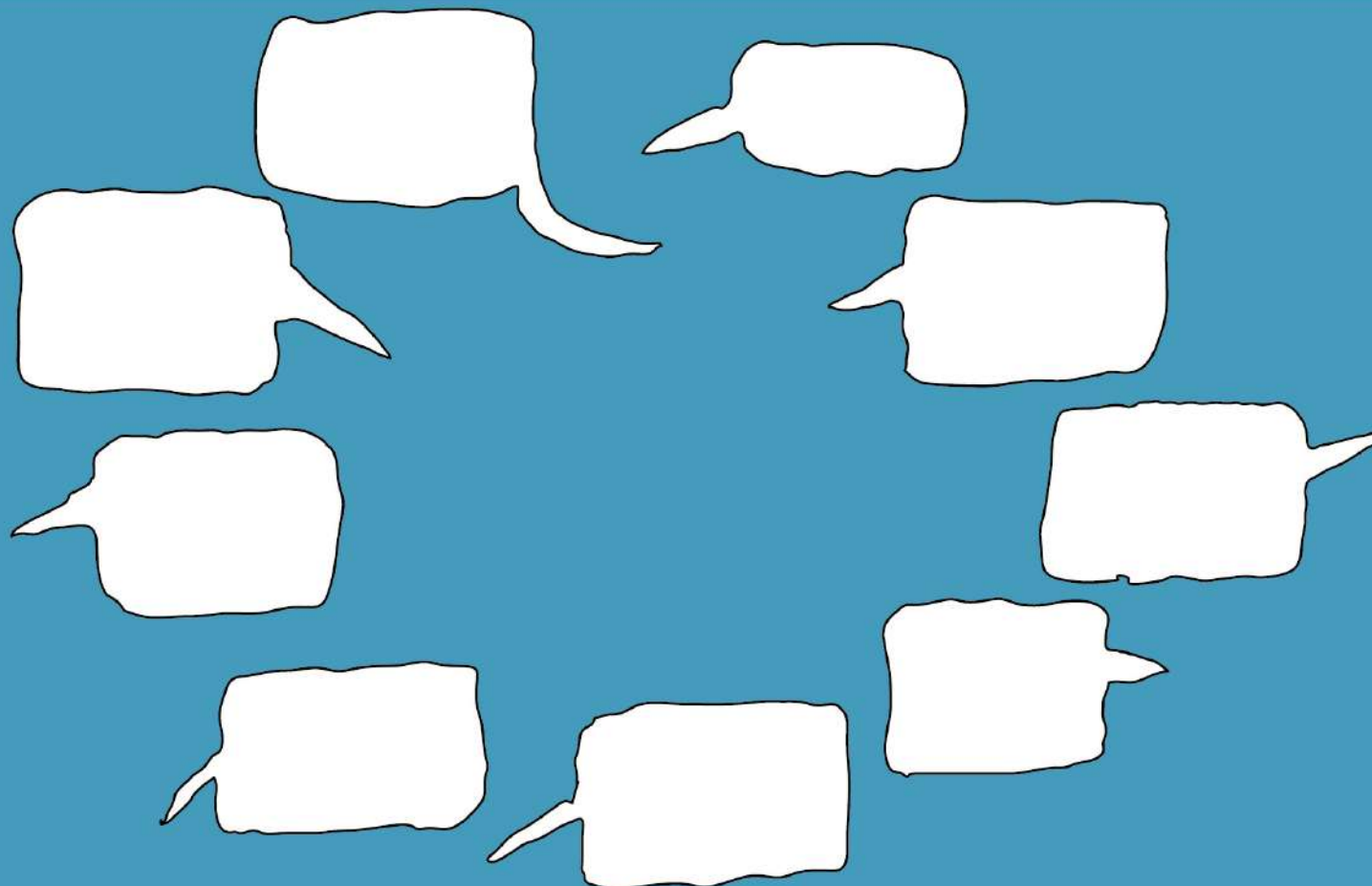


The CoAct project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No. 873048





CoActuem per la Salut Mental. Dibuix: Pau Badia

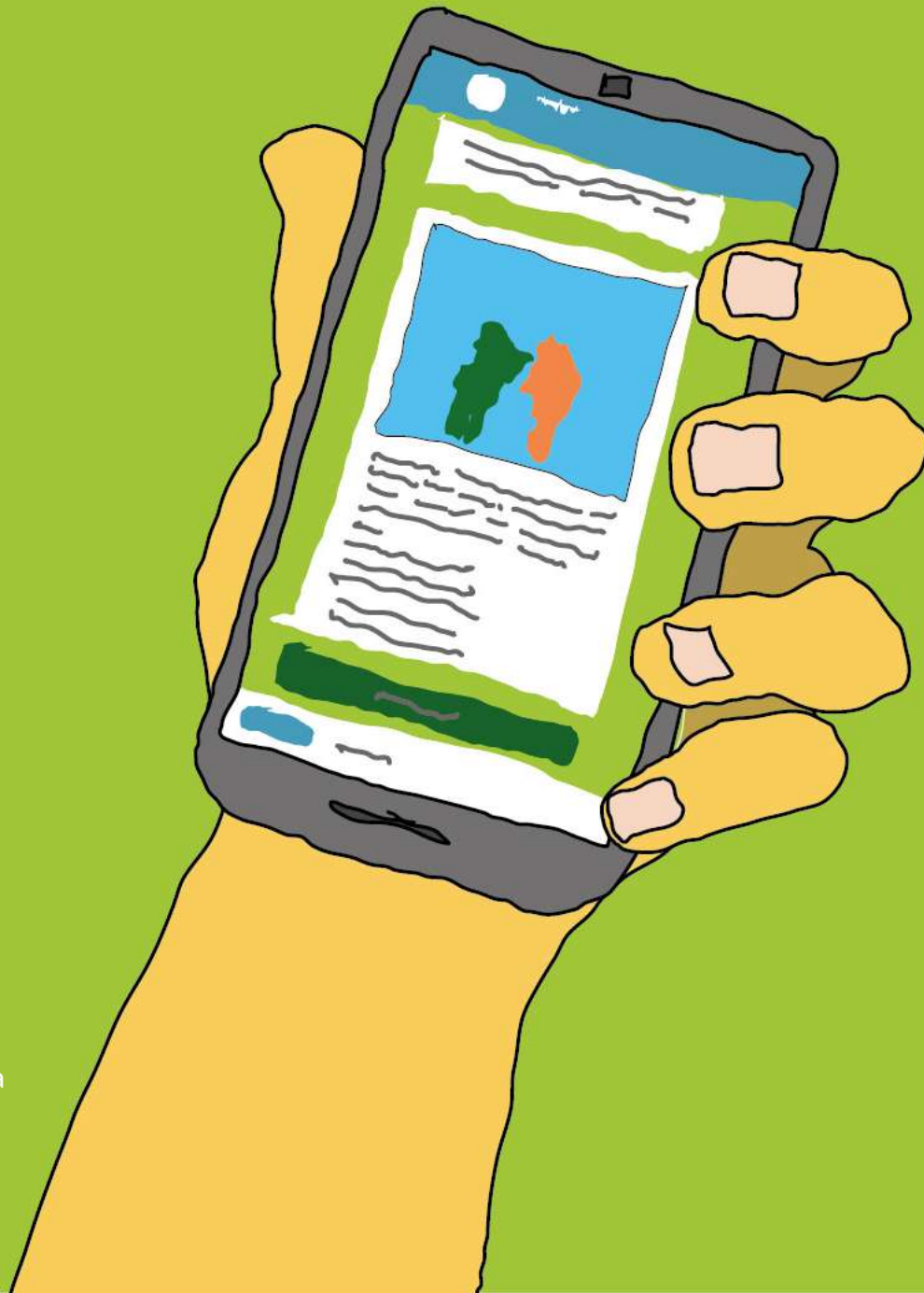


CoActuem per la Salut Mental. Dibuix: Pau Badia

Telegram



CoActuem per la Salut Mental. Dibuix: Pau Badia



Inici
Fases de recerca
Equips
+ Info

Ciència ciutadana per millorar les xarxes de suport social en salut mental

UNEIX-T'HI!


[Condicions d'ús de coactuem.ub.edu](#)
[Descarrega els fitxers de dades obertes](#)







El projecte CoAct rep finançament del programa de recerca i innovació Horizon 2020 de la Unió Europea amb contracte No. 873048



Web creada amb [programari lliure](#).

Made with <3 by  



<https://coactuem.ub.edu>



The CoAct project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No. 873048

Estació Ciutat: xAire

StemForYouth y experimentos públicos

Ciència i Acció Ciutadana

CoActuem per la Salut Mental

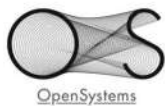
Mobilidad humana

Dilema R - Transform

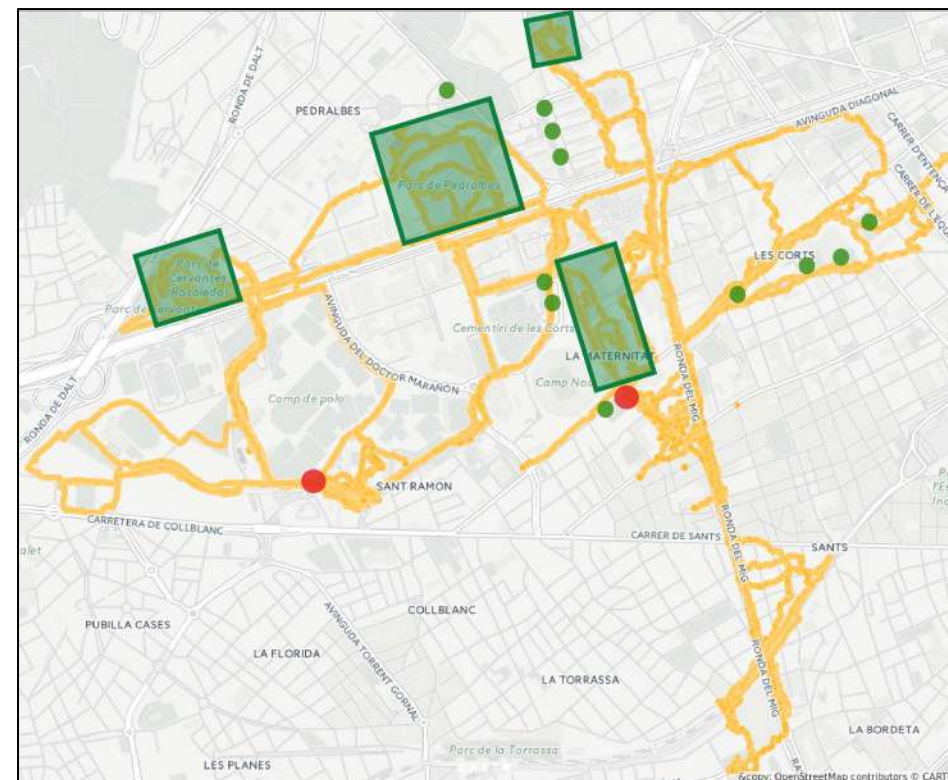
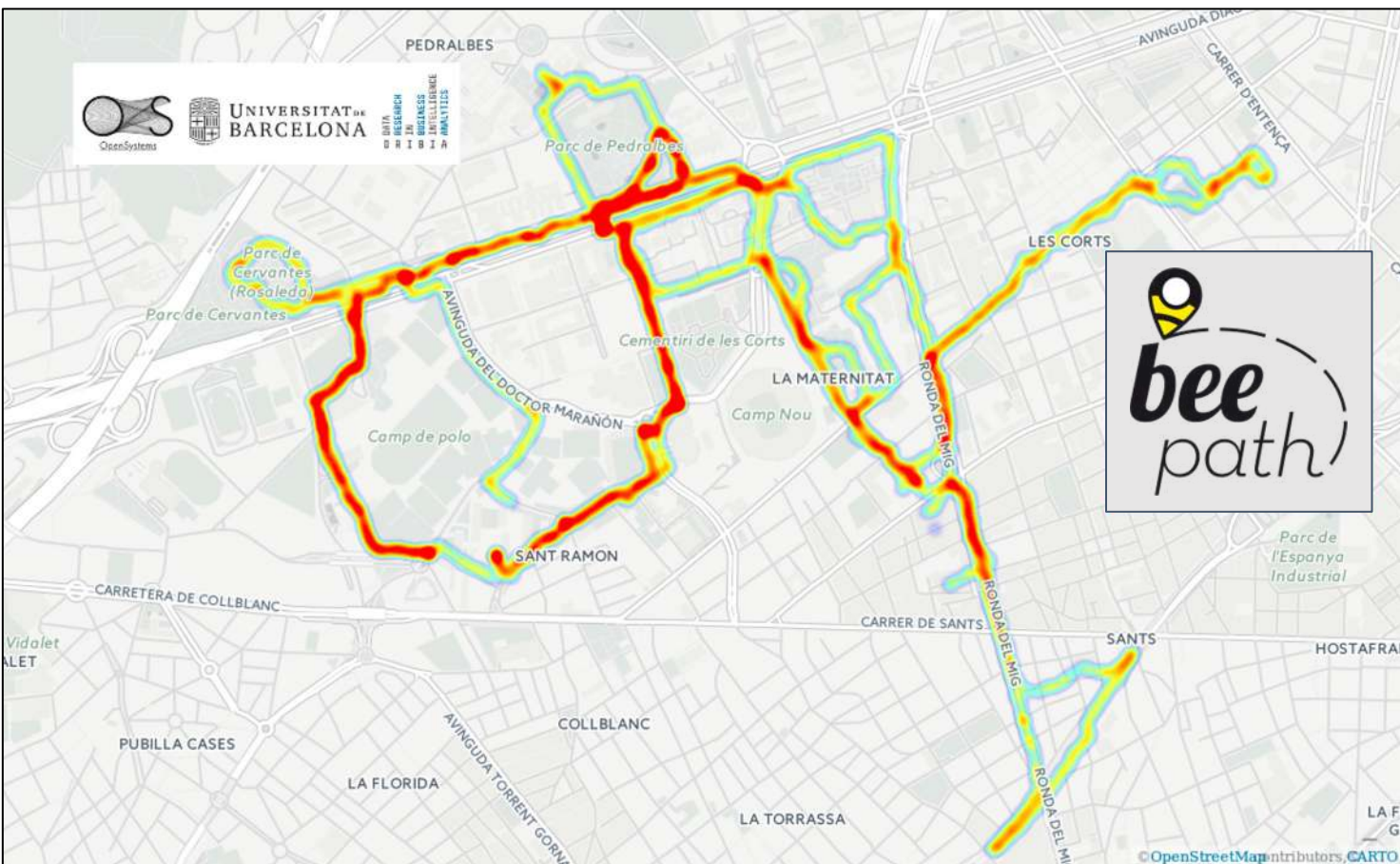


CIÈNCIA CIUTADANA EN **MOVIMENT**

Amb el suport de l'Ajuntament de Barcelona:



Investigamos Les Corts



Amb el suport de l'Ajuntament de Barcelona:



Investigamos Les Corts



Escuelas

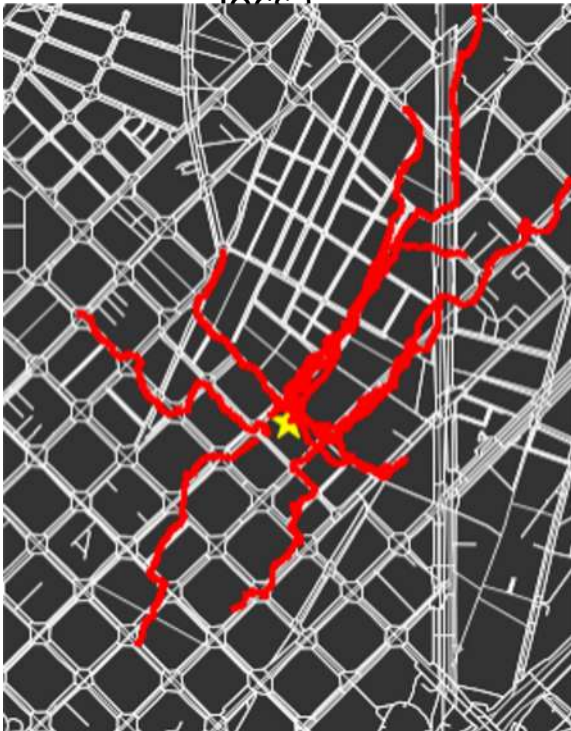


Amb el suport de l'Ajuntament de Barcelona



Escuelas

Juan Manuel Zafra Institute
(13 participants and ~5.000 GPS
locs.)



Sant Gabriel de Viladecans School
(28 participants ~12.000 GPS locs.)



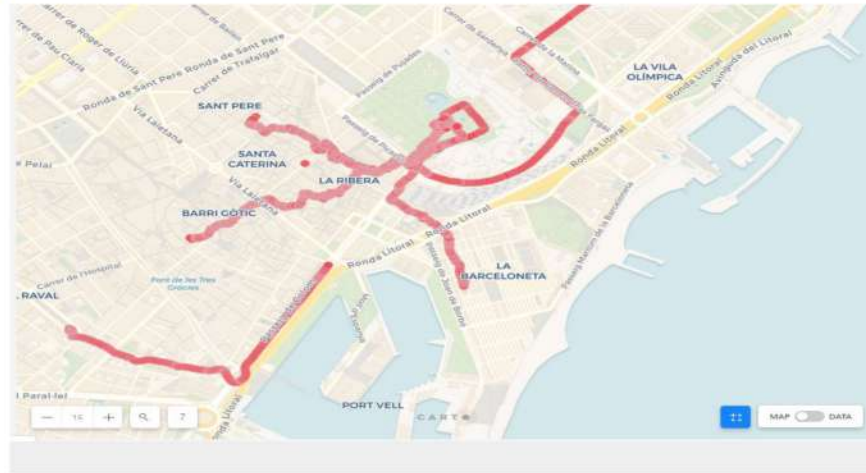
Amb el suport de l'Ajuntament de Barcelona:



MOBILITAT A L'HORA D'ENTRADA A L'INSTITUT VERDAGUER

Aquest treball ha estat realitzat per alumnes de 3r d'ESO de l'INS Verdaguer de Barcelona. El centre es troba ubicat dins del Parc de la Ciutadella. Alumnes representants: MALENA BAYARRI, JOANA CRUZATE, POL CUMPLIDO, LAURA DURO, MARC FERNÁNDEZ, MARIA ILLA, CAMILA MATOS, ÓSCAR PÉREZ.

Aquest experiment mostra la mobilitat de l'alumnat a l'hora d'arribar al centre. Al nostre Institut les classes comencen a les 8 hores i hem observat com tots els alumnes fan la seva entrada pel passatge dels Tíllers. Una de les dificultats que ens trobem és que la porta d'entrada al Parc del carrer Lluís Companys obre a les 8, hora a la que tots hem d'estar al centre.



El nostre projecte consisteix en realitzar un estudi per saber quina és la mobilitat de l'alumnat del nostre centre en el moment de començar les classes. Al nostre Institut fem horari compactat. Realitzant un estudi hem observat que l'alumnat d'ESO ve a l'Institut utilitzant els següents medis: Caminant (72%) - Patinet (16%) - Autobús (5%) - Bicicleta (5%) - Cotxe (2%). Hem fet ús de l'aplicació BEEPATH, que ens ha permès veure els trajectes realitzats per l'alumnat, fer un estudi de temps, posicions, velocitat mitjanes...

Conclusions i suggeriments

Sugeriment: Els alumnes demanen l'obertura de la porta del Parc de La Ciutadella (C/ Lluís Companys, aquesta porta obre passades les 8h). Molts alumnes evitarien haver de fer una volta al Parc per poder entrar al centre ja que únicament tenim dues portes obertes abans de les 7:30h als extrems del recinte.

Conclusió: Treballar les normes de circulació i utilització dels carrils bici, per tal de fer un millor ús d'aquestes instal·lacions.

FEM LA NOSTRA FESTA

**Descobrir i celebrar el Barri Primer de Maig
Granollers 2021-2022**



Escola Ferrer i Guàrdia



**Espai Actiu de
la Gent Gran**

ELISAVA

Escola Universitària de Barcelona
Disseny i Enginyeria



OpenSystems



UNIVERSITAT DE
BARCELONA



Obra Social "la Caixa"



Ajuntament de Granollers



→ Equipos de exploración

19 equipos, entre 3-6 personas

→ Misiones

Kit de exploración festiva

→ Wikiloc:

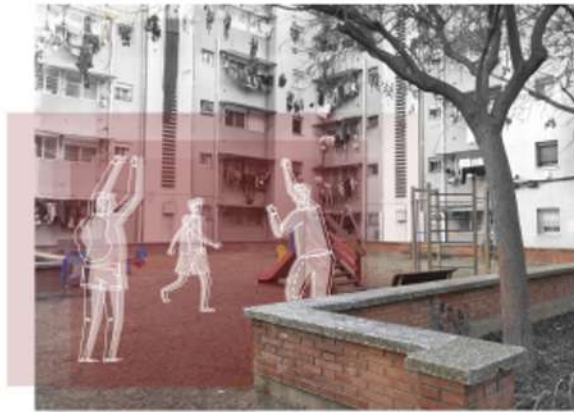
Registro GPS



Els parterres verds



Els espais intermitjos





lat0, lon0, t0

18:30:00

$\Delta t0=4s$

d0
 $v0=d0/\Delta t0$

lat1, lon1, t1

18:30:04

$\Delta t1=50s$

stop

lat2, lon2, t2

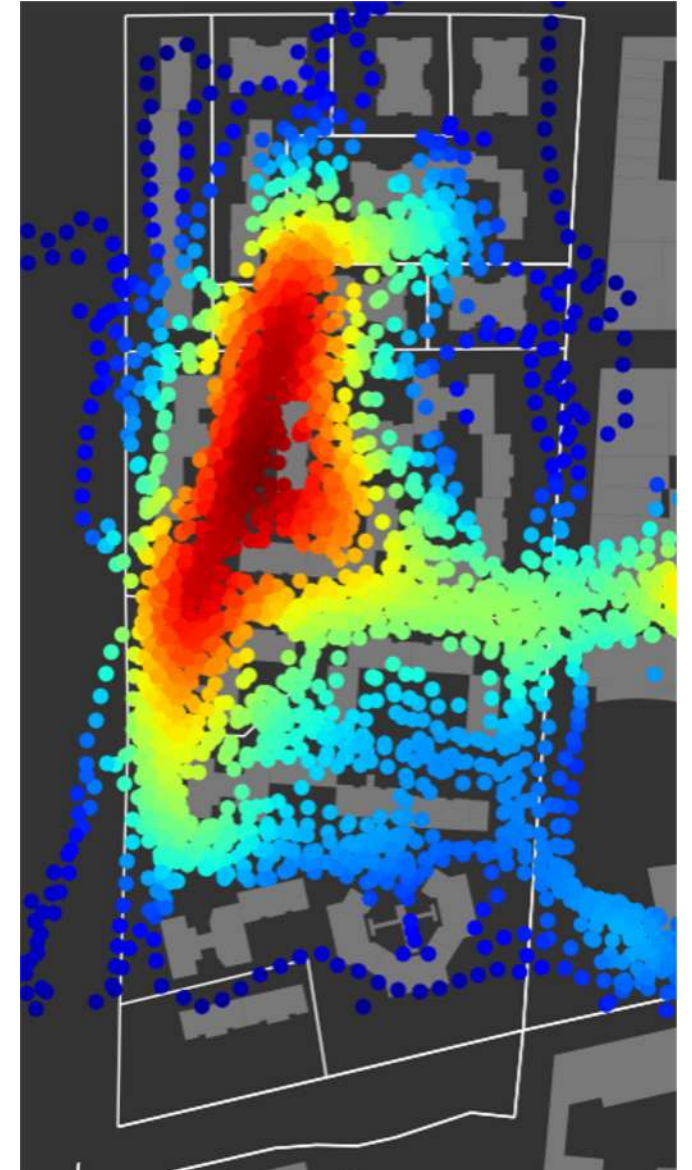
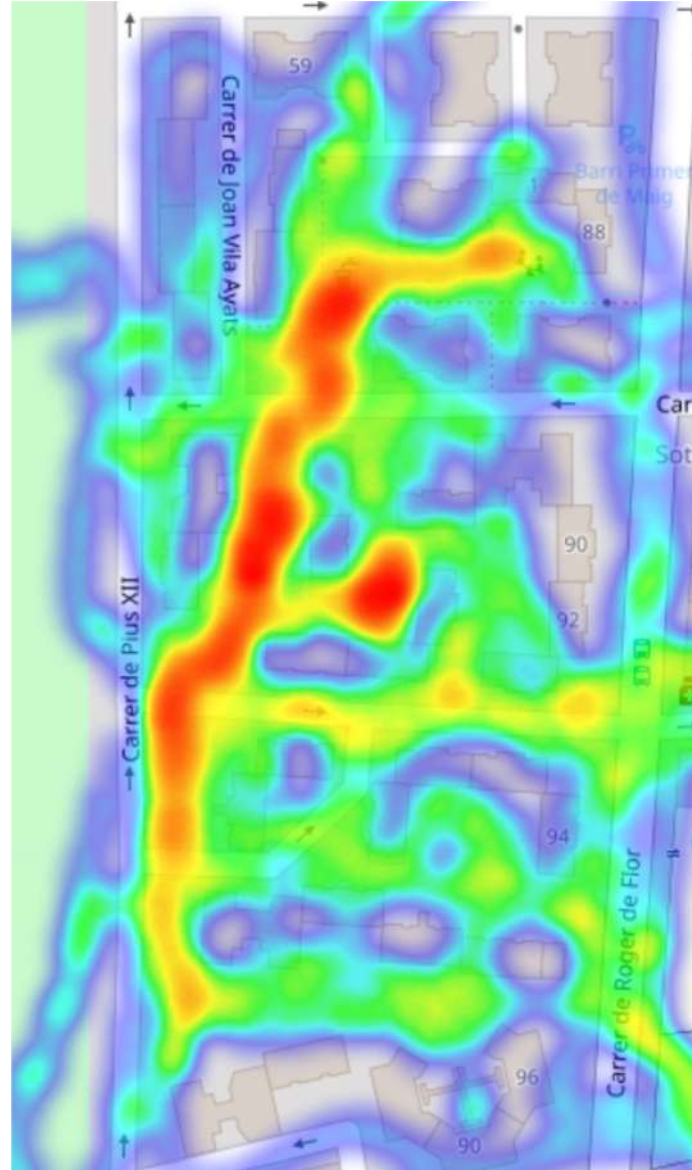
18:30:54

$\Delta t2=6s$

d2
 $v2=d2/\Delta t2$

lat3, lon3, t3

18:31:00

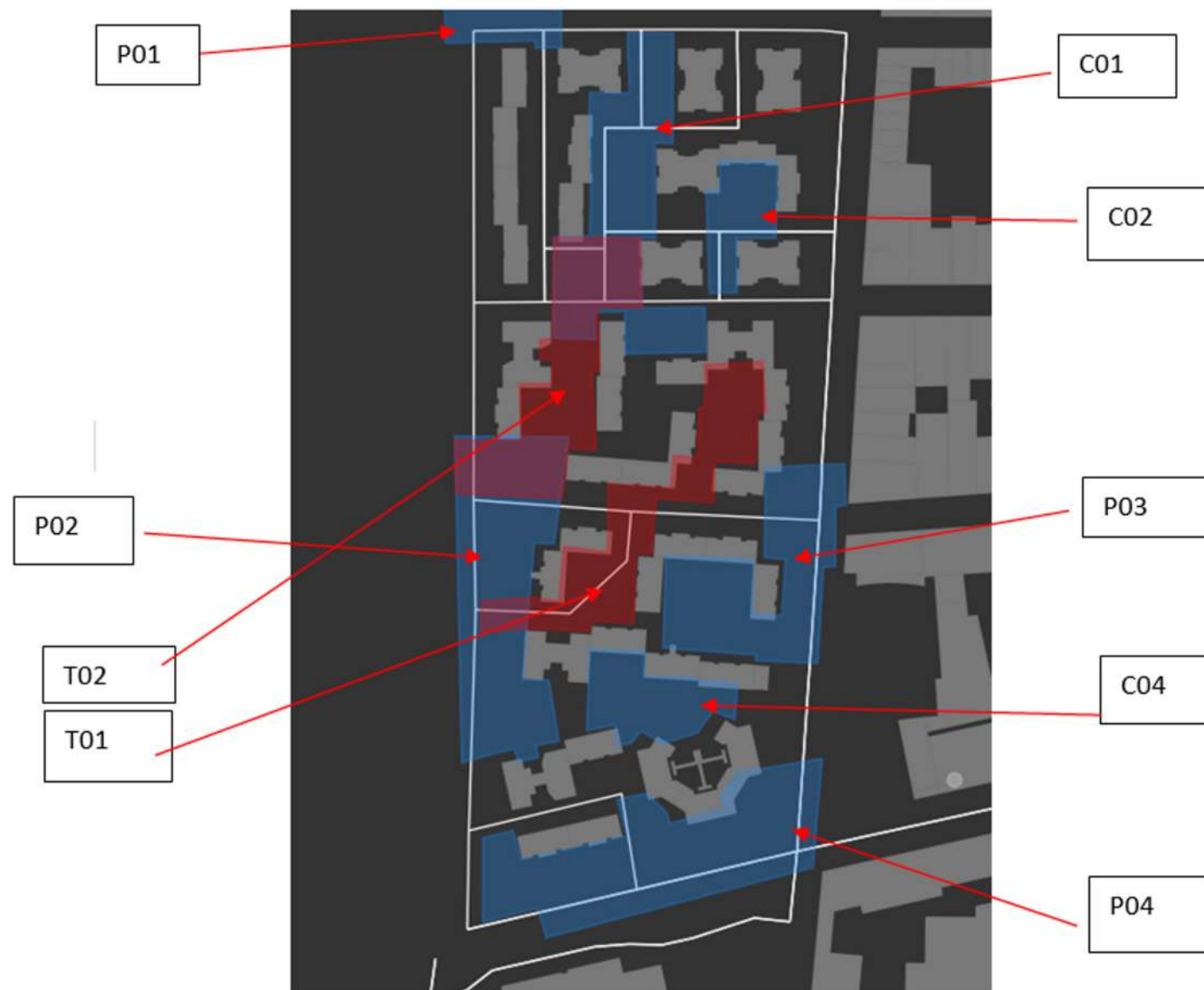


ATURADES

7 Unitats d'acci 

MOVIMENT

2 Unitats de transici 



ATURADES

7 Unitats d'acció

	unitats	num aturades	temps total aturades	temps promig aturada
0	p01	0	0	0.000000
1	c01	62	10452	168.580645
2	c02	13	3191	245.461538
3	p02	69	13423	194.536232
4	c04	8	3444	430.500000
5	p04	2	55	27.500000
6	p03	24	1792	74.666667



ATURADES

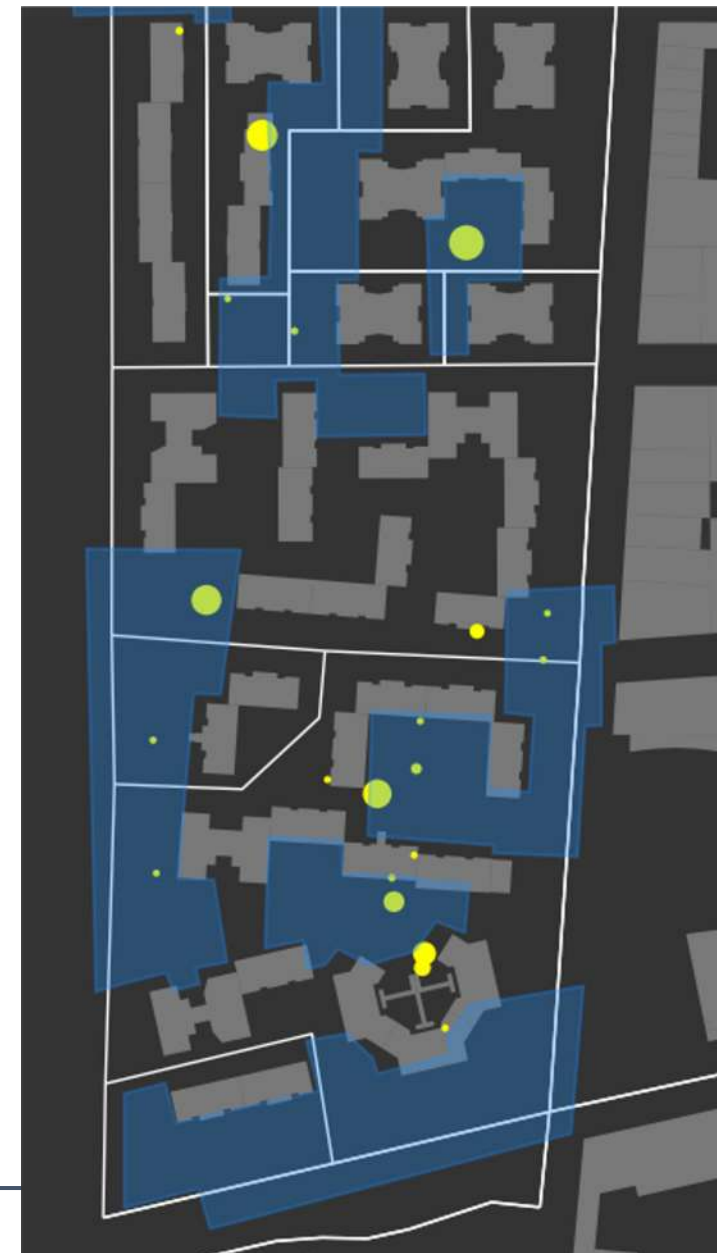
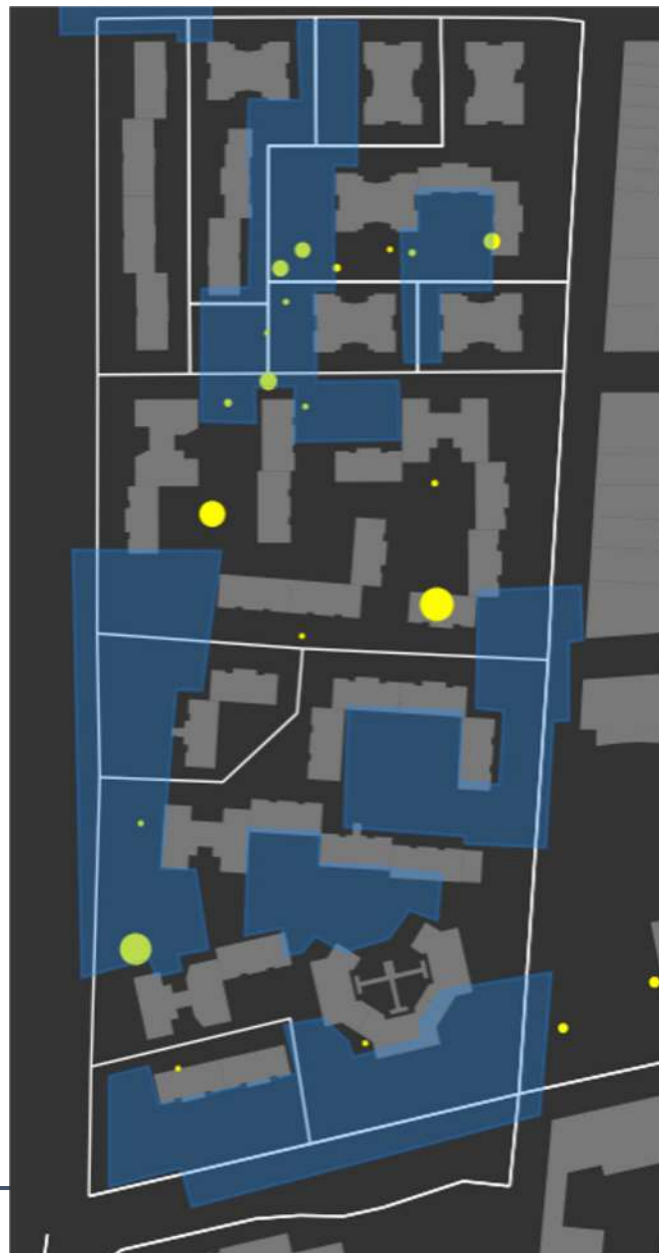
7 Unitats d'acció

grup G5:

26 aturades
 $T_{\text{stop}}=4,552 \text{ s}$
 $\langle t_{\text{stop}} \rangle = 175 \text{ s}$

grup E6:

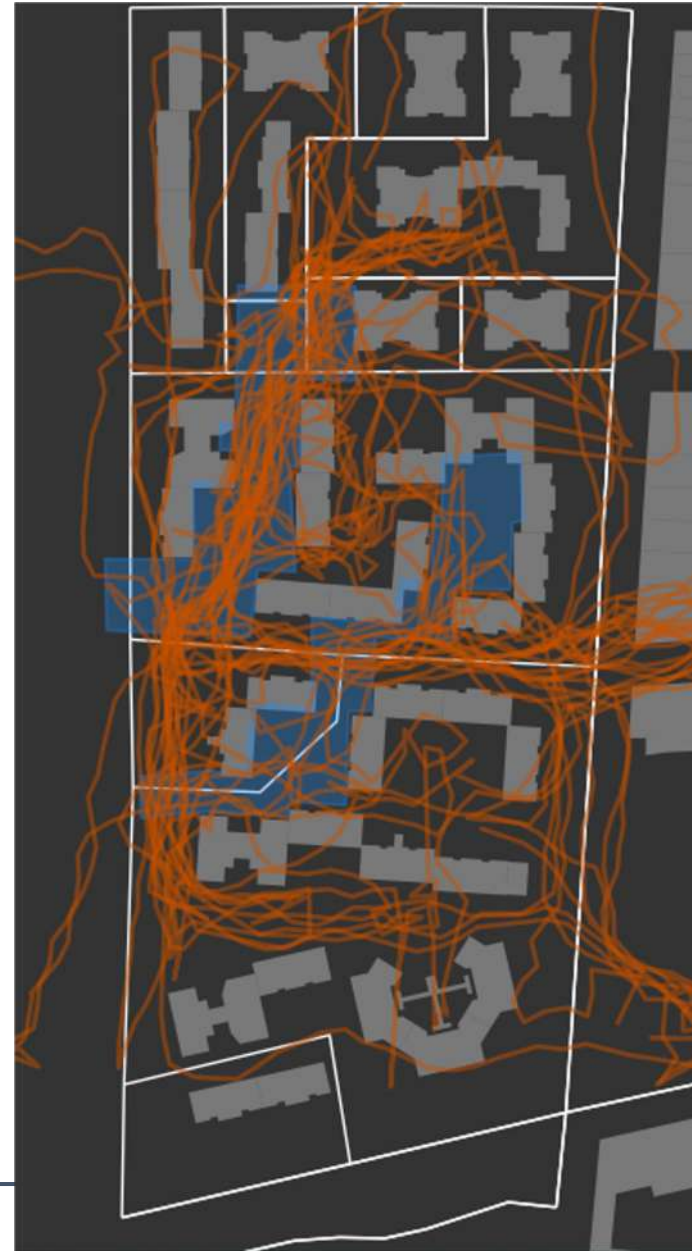
27 aturades
 $T_{\text{stop}}=3,235 \text{ s}$
 $\langle t_{\text{stop}} \rangle = 120 \text{ s}$



MOVIMENT

2 Unitats de transició

	unitats	num daddes dins	ratio dins fora %
0	T01	184	8.448118
1	T02	393	16.464181



MOVIMENT

2 Unitats de transició

grup G3:

1,551 GPS locs.

D=950 m

T=6,161 s

$\langle v \rangle = 0.9$ m/s

grup E6:

975 GPS locs.

D=1.8 km

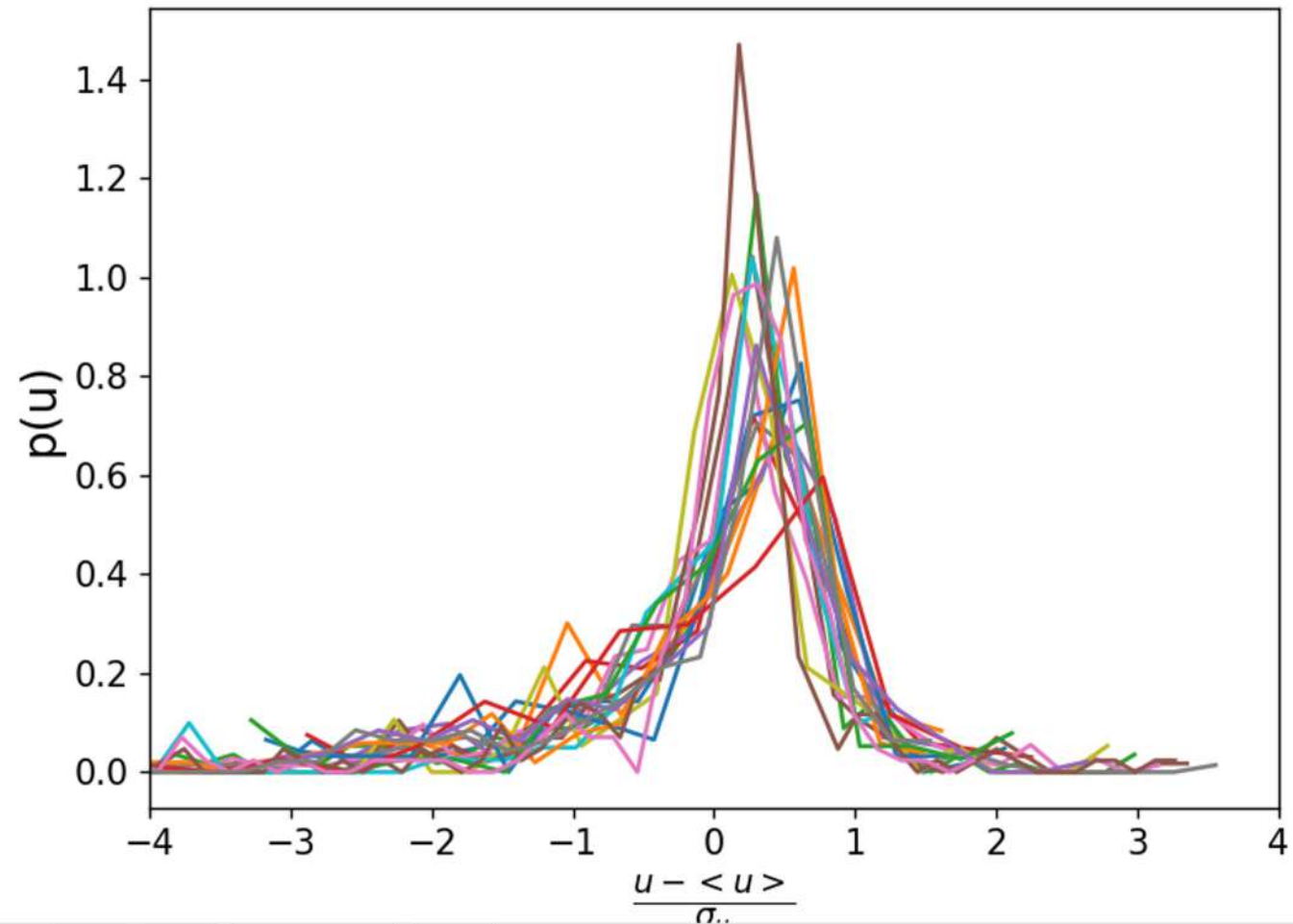
T=4,356 s

$\langle v \rangle = 1.44$ m/s



Probability density function. Instantaneous velocity

re-escalant per cada grup



Estació Ciutat: xAire

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Mobilidad humana

Dilema R - Transform



IMPACT IN PUBLIC POLICY

The regional government takes the results into account when planning the implementation of innovative separate waste collection systems in the city.



CHALLENGE



The local government wants to introduce innovations in the waste collection system. It wants the public to be well informed, to know what they think about it and to anticipate possible barriers to implementation.

DILEMMA R CO-CREATION

Participatory workshops with municipality & citizens to define relevant variables. Digital development of the game.



DILEMMA R IMPLEMENTATION

Secondary school students collaborate in the design of the data collection protocol, participate in data collection and analysis, and elaborate proposals.



This project has received funding from the European Union's Horizon2020 research and innovation programme under grant agreement No 872687.

Decisió final

Gènere

- ☒ Selecciona-ho tot
- ☒ Masculí
- ☒ Femení
- ☒ No binari/Altres
- ☒ Prefereixo no contestar

Nivell educatiu

- ☒ Selecciona-ho tot
- ☒ Sense estudis
- ☒ Primària
- ☒ Secundària
- ☒ Batx., FP...
- ☒ Universitaris

Edat

- ☒ Selecciona-ho tot
- ☒ 14 - 20 anys
- ☒ 21 - 30 anys
- ☒ 31 - 40 anys
- ☒ 41 - 50 anys
- ☒ 51 - 64 anys
- ☒ 65 - 74 anys
- ☒ +75 anys

Tipus d'habitatge

- ☒ Selecciona-ho tot
- ☒ Casa
- ☒ Bloc petit
- ☒ Bloc gran
- ☒ Altres

Recòmpte de participants

488

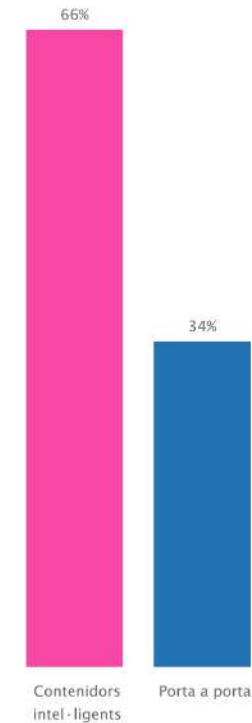
Barris

- ☒ Selecciona-ho tot
- ☒ Centre
- ☒ Col·legis Nous
- ☒ Estació del Nord
- ☒ Estació de França
- ☒ Calderí
- ☒ Santa Rosa
- ☒ Plana Lledó
- ☒ Can Borrell
- ☒ Can Pantiquet
- ☒ Riera Seca
- ☒ La Casilla
- ☒ Lourdes
- ☒ Can Prat
- ☒ Farinera
- ☒ Can Magarola
- ☒ Àrea de Tir Olímpic
- ☒ Gallecs

Estructura familiar

- ☒ Selecciona-ho tot
- ☒ Una persona
- ☒ 2 persones o més sense nucli
- ☒ Parella amb fills
- ☒ Parella sense fills
- ☒ Pare o mare amb fills
- ☒ Dos nuclis o més

Quin sistema prefereixes?



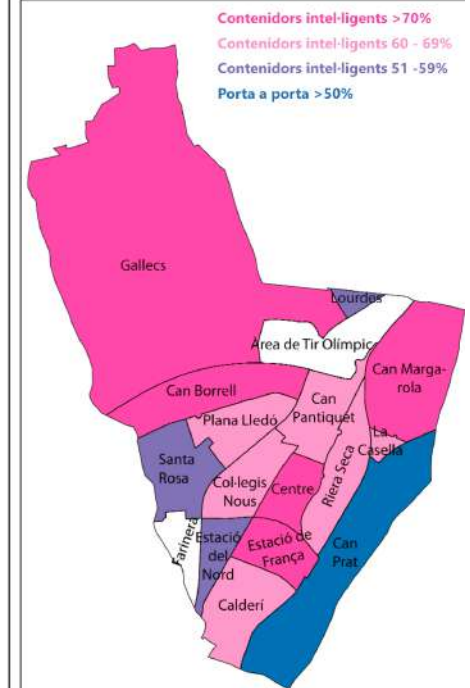
Seguretat resposta

Tot

Duració vàlida

Tot

Sistema preferit segons el barri





SIMPOSIO INTERNACIONAL DE EDUCACIÓN
AMBIENTAL DE LA CIUDAD DE BUENOS AIRES

Tendiendo puentes para un presente y un futuro sustentables

¡Muchas gracias!