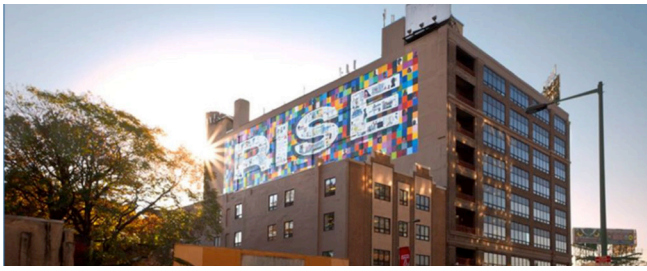
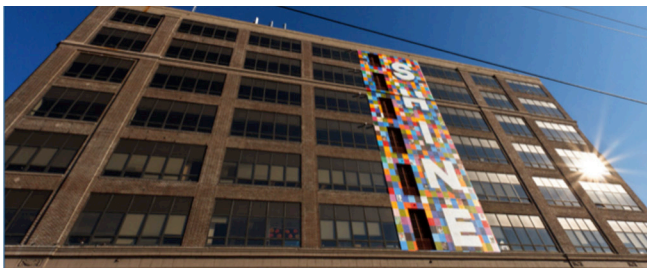
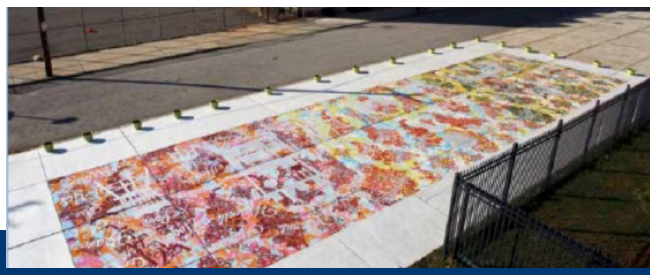
Porch Light Program

Final Evaluation Report







JACOB KRAEMER TEBES, PHD
Yale University School of Medicine

SAMANTHA L. MATLIN, PHD
Philadelphia Department of Behavioral Health and Intellectual disAbility Services & Yale University School of Medicine

BRONWYN HUNTER, PHD
AZURE B. THOMPSON, DPH
DANA M. PRINCE, PHD
NATHANIEL MOHATT, PHD
Yale School of Medicine

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Institutional Review Board approval for this evaluation was obtained from both the City of Philadelphia and Yale University.

Dr. Thompson is now at the National Center on Addiction and Substance Abuse at Columbia University (CASAColumbia) and Dr. Mohatt is now at the Western Interstate Commission for Higher Education.

This final report replaces the May 12, 2015 pre-publication copy; there were no substantive changes to the previous report. To download a copy of this report, go to:
consultationcenter.yale.edu/798_218966_Porch_Light_Program_Final_Evaluation_Report_Yale_University.pdf or consultationcenter.yale.edu

June 2015

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*Note: See the Appendix for additional tables.

Executive Summary

Can public art promote public health? This is the central question addressed in this four-year evaluation of the Porch Light Program, a collaborative endeavor of Philadelphia Mural Arts Program and the Philadelphia Department of Behavioral Health and Intellectual disability Services (DBHIDS). Porch Light creates public murals that seek to transform neighborhoods and promote the health of neighborhood residents and individuals who help create the mural. This collaboration involves a variety of stakeholders, including behavioral health consumers, artists, family members, service providers, neighborhood residents, and the leadership and staff from two city departments.

Background

The evaluation was guided by a theory of change that specifies how certain neighborhood characteristics, collective efficacy among residents and aesthetic qualities of the neighborhood, can reduce established health risks associated with neighborhood decay and disorder. Public murals were expected to enhance these neighborhood characteristics in the short-term so as to promote long-term community health. The Porch Light theory of change also specifies how creation of a public mural by individuals with mental health or substance abuse challenges (i.e., behavioral health consumers) can reduce behavioral health stigma and enhance individual recovery and resilience. In collaboration with Porch Light stakeholders, the research team developed a logic model based on this underlying theory of change to guide the evaluation and examine community- and individual-level outcomes.

The Porch Light Evaluation was part of a larger initiative, the Philadelphia Community Health Project (PCHP), conducted in collaboration with DBHIDS. The purpose of PCHP was twofold: to identify appropriate comparison neighborhoods and participants from behavioral health agencies in Philadelphia for the Porch Light Evaluation, and to provide additional data to DBHIDS on the well-being, service use, and neighborhood conditions experienced by persons receiving behavioral health services. Porch Light and PCHP neighborhoods and agencies were matched on key characteristics, including conditions of neighborhood decay and disorder as well as demographic and neighborhood risk indicators, so as to enhance the scientific rigor of the evaluation.

Porch Light creates public murals that seek to transform neighborhoods and promote the health of neighborhood residents and individuals who help create the mural.

Eight Philadelphia neighborhoods and seven behavioral health agencies located in those neighborhoods participated in the Porch Light evaluation. The community-level evaluation included person-on-the-street interviews with more than 1,300 residents and systematic observations of hundreds of blocks. Neighborhood interviews and observations were conducted twice per year, and in consecutive years in four neighborhoods. To assess individual-level outcomes, 264 individuals receiving behavioral health services in participating agencies completed interviews; 122 participants enrolled in the Porch Light Program and 142 in usual services at comparison agencies. Individuals were followed for up to one year and interviewed up to three times depending on their availability. An additional 10 Porch Light participants also completed case study interviews to share their experiences of the program.

Over two program years, six murals were included in the Porch Light evaluation; five were assessed for community impact and five for individual impact. Details and photos of these murals, including the artists responsible, agencies involved, and their location are included in the report.

Impact of Porch Light on Community Outcomes

Community-level results showed that over the course of about one year, residents living within one mile of a newly installed mural reported:

- A relative increase in collective efficacy, including social cohesion and trust among neighbors as well as informal social control.
- A relative increase in neighborhood aesthetic quality, including overall aesthetic quality, the walking environment, ratings of specific buildings, and perceived neighborhood safety.
- A relative decrease (at a statistical trend) in stigma toward individuals with mental health or substance abuse challenges.

Also, after almost two years, residents living within one mile of more than one newly installed mural reported:

- A sustained relative increase in collective efficacy, including social cohesion and trust among neighbors as well as informal neighborhood social control.
- A modest but sustained relative increase in perceptions of neighborhood aesthetic quality, including the quality of the walking environment and perceived neighborhood safety.
- A promising and sustained relative decrease (again at a statistical trend) in stigma toward individuals with mental health or substance abuse challenges.

Impact of Porch Light on Individual Outcomes

Individual-level results compared outcomes of individuals in program and comparison sites across one year. Results across all program sites combined showed no statistically significant effects, although there was a statistical trend for less use of secrecy by Porch Light participants to cope with social stigma.

Subsequent examination of Porch Light attendance and participation revealed substantial differences across the three program sites. In Site A, mostly the same group of participants attended about every other week; in Site B, a varying group of participants attended about every other week; and, in Site C a varying group of participants attended about every 4-5 weeks. The effects for each site showed modest effects only for Site A, and some promising effects for Sites B and C. Participants in Site A showed:

- A relative decrease in the use of secrecy to cope with behavioral health stigma.
- A relative decrease (at a statistical trend) in reports of rejection experiences due to stigma.
- A relative decrease in stress.

Lastly, case study interviews of Porch Light participants indicated that the program can enhance friendships, sense of self, a desire to give back to one's community, and hope for the future.

Implications and Conclusions

We began this report with the question: Can public art promote public health? This evaluation strongly suggests that the answer is "yes." Public murals promote changes in residents' perceptions about their neighborhood to reduce health risks due to neighborhood decay and disorder. Specifically, increases in residents' perceptions of collective efficacy and neighborhood aesthetic quality in the years following installation of a public mural provide evidence of the public health impact of murals. Another community-level finding was that public murals that are focused on behavioral health themes and produced with the support of behavioral health consumers and stakeholders, can reduce behavioral health stigma among neighborhood residents.

The evidence in support of an individual health impact of murals is more mixed. Case study interviews of Porch Light participants showed clear individual benefits, and evidence from one agency site that implemented the program with mostly the same group of participants who attended consistently showed modest impacts on stigma and stress. However, when the program was implemented with less frequent or inconsistent attendance in two sites, few effects were observed. Individual-level results are clearly promising but inconclusive, and await future research in which the program is implemented with greater fidelity and with larger samples.

Although the evaluation showed impacts on collective efficacy and neighborhood aesthetic quality, the mechanism that explains how public murals lead to these outcomes remains unclear. Possible mechanisms suggested in the case study and the community interviews are that murals stimulate narratives of cultural and community connection, beauty, resilience, and hope. Such narratives may stand in contrast with prevailing narratives of neighborhood decay and disorder, and thus inspire residents to appreciate their neighborhood's aesthetic qualities, foster a sense of cohesion with other neighbors, and nurture a belief that residents look out for one another. The evidence for such a narrative is only conjecture at this point, but is consistent with what we heard from Porch Light participants and community residents, and also aligns with the results of the community-level analyses. Future research should examine these potential mechanisms.

Finally, a defining impact of public murals may be that they serve as a catalyst for social change. The powerful effects observed in this evaluation on neighborhood collective efficacy and aesthetic quality suggest that public murals, at least those done through Porch Light, not only beautify a neighborhood but may also mobilize residents for community action. Elsewhere, the Porch Light collaborative team has described how another Philadelphia mural, *Finding the Light Within*, which was focused on suicide, mobilized a community that had been touched by the loss of a loved one or someone they knew (Mohatt et al., 2013). That initiative brought together more than 1,200 people who had experienced such a tragic loss. *Finding the Light Within* provided an opportunity for raising awareness about suicide prevention, reducing the stigma of suicide for loved ones, and bringing together a diverse community for healing.

Perhaps the singular power of murals then is to engage a community, defined geographically or through a common experience, to come together to find meaning and shared purpose, including action for social change. Although creating a mural is a complex process that involves multiple stakeholders, this process may be only a precursor to an even more complex collaboration, one that builds on the outcomes observed here to mobilize diverse stakeholders within a community to address shared needs. That work can take many forms, such as seeking to improve health outcomes or reducing disparities, or addressing other social determinants, such as housing, crime, employment, education, racism, or structural inequities. This may be the true legacy of Porch Light – creating public murals as an opportunity and a catalyst for social change.

Porch Light Program: Final Evaluation Report

Can public art promote public health? That question is the focus of this report. For the past eight years, Philadelphia Mural Arts Program and the Philadelphia Department of Behavioral Health and Intellectual disAbility Services (DBHIDS) have collaborated to create public murals that transform neighborhoods and promote health. Known as the Porch Light Program, this collaboration engages various stakeholders in the mural-making process, including behavioral health consumers[1], artists, family members, service providers, neighborhood residents, and the leadership and staff of two city departments.

In this report, we summarize a four-year evaluation of the Porch Light Program that focuses on two sets of outcomes: the impact of public murals on neighborhood residents and on individuals with behavioral health challenges who helped create the mural. We conclude by discussing the implications of these findings for public health.

Background

Behavioral health services and supports can promote recovery and resilience, which are critical to individual health and well-being (Evans, Lamb, & White, 2013). By recovery, we refer to a process in which an individuals, regardless of mental health or substance abuse challenges, are capable of leading a fulfilling and purposeful life (Davidson, Tondora, Connell, Kirk, Rockholz, & Evans, 2007). By resilience, we refer to capacity of individuals to adapt successfully to adverse life circumstances (Tebes, Perkins, Irish, & Puglisi, 2004).

We also know that arts-based interventions can increase a sense of empowerment, foster social inclusion, and reduce stigma for persons with behavioral health challenges (Hacking, 2006; Jermyn, 2001; Slayton, D'Archer, & Kaplan, 2010; Stein & Faigin, 2015). Such interventions can be an effective adjunct to behavioral health treatment. However, behavioral health services alone may not be enough, even when combined with arts-based interventions, because of the powerful impact that distressed neighborhood environments can have on health and well-being (Matlin, Evans, & Tebes, 2014).

There is now clear evidence that neighborhood disorder and decay (e.g., graffiti, abandoned cars and buildings, trash, dilapidated housing, public drunkenness, street fights, etc.) increase residents' risk for psychological distress, depression, substance abuse, post-traumatic stress disorder, and a sense of powerlessness (Cutrona, Russell, Hessling, Brown, & Murray, 2000; Gapen et al., 2011; Geis & Ross, 1998; Kruger, Reischl, & Gee, 2007; Ross, 2000; Silver, Mulvey, & Swanson, 2002). Such neighborhoods often have higher rates of poverty, unemployment, violence, and crime (Mujahid, Roux, Morenoff, & Raghunathan, 2007; Silver et al., 2002; Sampson, Raudenbush, & Earls, 1997), which may stigmatize the neighborhood itself (Sampson & Raudenbush, 2004) and adversely impact even the most resilient person or family that lives there.

There is growing evidence, however, that certain neighborhood characteristics can offset these risks to residents in distressed neighborhoods. Neighborhood collective efficacy, which is a combination of cohesion and trust among neighbors and informal means of social control, as well as various neighborhood aesthetic qualities, such as its walking environment, perceived safety, and other aesthetic features, can reduce health risks from disorder and decay (Gapen et al., 2011; Henry, Gorman-Smith, Schoeny, & Tolan, 2014; Kruger et al., 2007; Mujahid et al., 2007; Pickett & Pearl, 2001; Sampson et al., 1997). Efforts to transform neighborhoods to promote these characteristics hold promise for improving the health of residents and those who receive services or work there.

...cohesion and trust among neighbors and informal means of social control, as well as various neighborhood aesthetic qualities... can reduce health risks from disorder and decay.

The idea that neighborhoods can impact health draws on a public health perspective that takes into account social determinants of health, such as poverty, resource disparities, racism, and neighborhood conditions, among others, as central influences on health and related disparities (Braveman, Egerter, & Williams, 2011; Marmot & Wilson, 2005). Focusing on social determinants, such as neighborhood conditions, is a promising approach to promote public health that can complement targeted clinical or preventive health interventions. Public art offers a potential vehicle for positive neighborhood impact (Guetzkow, 2002) that addresses social determinants.

Theory of Change, Logic Model, and Hypotheses

The Porch Light evaluation is based on a theory of change that emphasizes both community-level and individual-level outcomes, and draws on research and practice in public health and community psychology. It was developed by Porch Light stakeholders, including artists, DBHIDS and Mural Arts staff, behavioral health consumers, service pro-

1 We use the term "behavioral health consumers" to refer to individuals receiving services for mental health or substance abuse challenges.

viders, funders, and the evaluation team. During the initial year of the evaluation, the theory of change was used to develop a logic model to guide program implementation and evaluation. A logic model depicts resources, activities, outputs, and expected outcomes of a program (Tebes, Kaufman, Connell, Crusto, & Thai, 2014); this model was updated as appropriate and is included as Appendix Figure A1. Details about Porch Light Program activities, including implementation of its program phases is included in the Results section and the Porch Light Program Replication Manual (Ansell, Matlin, Evans, Golden, & Tebes, 2015), which serves as a companion document to this report.

Central to the Porch Light theory of change is the assumption that neighborhoods are a social determinant of health that can increase or reduce risk for mental health or substance abuse problems. We also assume that mural making can be one approach to reduce risk that can impact both the community and individual levels. Our first hypothesis was that public murals can have a positive public health impact on neighborhood residents to reduce risk. Since these health impacts would require many years to take effect, we also developed short-term hypotheses (e.g., 1-2 years) about the impact that public murals could have on factors previously shown to impact public health, such as neighborhood collective efficacy, neighborhood aesthetic quality, and public behavioral health stigma. Specifically, we hypothesized that murals that incorporate issues of resilience and community connection will promote collective efficacy among neighborhood residents; that is, increased cohesion and trust among neighbors and enhanced informal social control. We also hypothesized that murals would enhance the overall aesthetic quality of the neighborhood near a mural, including the walking environment, related aesthetic neighborhood characteristics, and perceptions of neighborhood safety. Finally, since Porch Light murals focus on narratives of overcoming behavioral health challenges, are publicly linked to behavioral health clinics and settings, and publically acknowledge the involvement of behavioral health consumers in their development, we expected murals to create a positive public narrative about mental health and substance abuse issues that would reduce behavioral health stigma among neighborhood residents. These hypothesized relationships are depicted in Figure 1.

Our second hypothesis was that mural making would promote recovery and resilience among individuals with behavioral health challenges who worked on a mural, and that recovery and resilience would enhance individual health and well-being. As shown in Figure 2, since mural making is expected to have a long-term impact on individual health and well-being, we developed short-term hypotheses about the impact of mural-making on stigma, recovery, and related factors. Consistent with research on

Figure 1. Short- and Long-Term Public Health Impacts of Porch Light Murals

arts-based behavioral health interventions, our specific hypotheses were that group-based mural making would reduce personal and social stigma, increase a sense of empowerment and recovery, increase social support, reduce stress, and increase engagement in recovery-oriented services.

Figure 2. Short- and Long-Term Recovery and Resilience Impacts of Porch Light Murals

This combination of community- and individual-level expectations illustrates how Porch Light combines a public health perspective with one that emphasizes individual recovery and resilience.

Evaluation Design

This evaluation research was part of a larger initiative, the Philadelphia Community Health Project (PCHP) that was conducted in collaboration with DBHIDS. The Porch Light Evaluation was focused on examining outcome hypotheses in relation to the development and installation of public murals. PCHP has a broader purpose – it identifies comparison sites and participants for the Porch Light Evaluation but also provides additional data to DBHIDS on the well-being, service use, and neighborhood conditions experienced by individuals receiving behavioral health services in distressed Philadelphia neighborhoods. Through the PCHP, we collected data that enabled us to ensure that

mural and comparison neighborhoods were comparable on key characteristics, including neighborhood decay and disorder. Also, through the PCHP, we gathered information from individuals receiving behavioral health services that could ensure that Porch light and comparison participants were comparable on demographic indicators and other key characteristics. We then incorporated some of these data to control statistically for pre-existing neighborhood or service population differences in the analyses.

In the Porch Light evaluation, **we used a community-based participatory research (CBPR)** approach embedded in a comparative outcome trial. In CBPR, researchers and other stakeholders collaborate as partners to conduct research, such that program activities or other naturally-occurring behaviors under study are carried out with minimal interference by the researcher. The intention is to study a phenomenon with a light researcher "footprint" so that naturally-occurring processes can be understood or evaluated for impact. In the Porch Light evaluation, artists implemented the program in collaboration with agency partners and Mural Arts Program using their own artistic style and approach, rather than following a prescribed model specified by the research team. The main constraints on implementation were that the program needed to occur during one program year starting in the fall, involve weekly workshop sessions with participants, include Open Studios and Community Paint Days in the spring (both are described in the Porch Light manual), and generally follow the three Porch Light phases (Engage, Create, Generate; also described in the manual and in the Results section). We collaborated with Mural Arts and agency staff to monitor implementation and attendance across sites.

A randomized controlled trial is the gold standard for evaluating the effectiveness of social and health interventions (Tebes et al., 2014). However, since this was not possible in the current evaluation, we embedded CBPR into a **comparative outcome design** to enhance scientific rigor. In a comparative outcome design, two or more equivalent groups (of participants or agencies or communities) are compared before and after implementation of an intervention using the same measures and procedures. For the Porch Light Evaluation, we collected data from individuals receiving behavioral health services from agencies in Philadelphia neighborhoods with elevated levels of poverty, unemployment, and crime. Invited agencies that agreed to incorporate mural making into their usual behavioral health services were then linked to an artist selected by Mural Arts Program and provided with technical support to implement the program as described in the Porch Light manual. Once an agency agreed to participate, a comparison agency was identified that was located in a neighborhood with comparable levels of poverty, unemployment, and crime, and that was similar in racial and ethnic composition. Program and comparison site agencies were identified in close collaboration with DBHIDS to ensure that both pairs of matching agencies served client populations similar in mental health or substance abuse challenges. Agencies identified as potential comparison sites were then invited by DBHIDS and the evaluation team to participate in the PCHP.

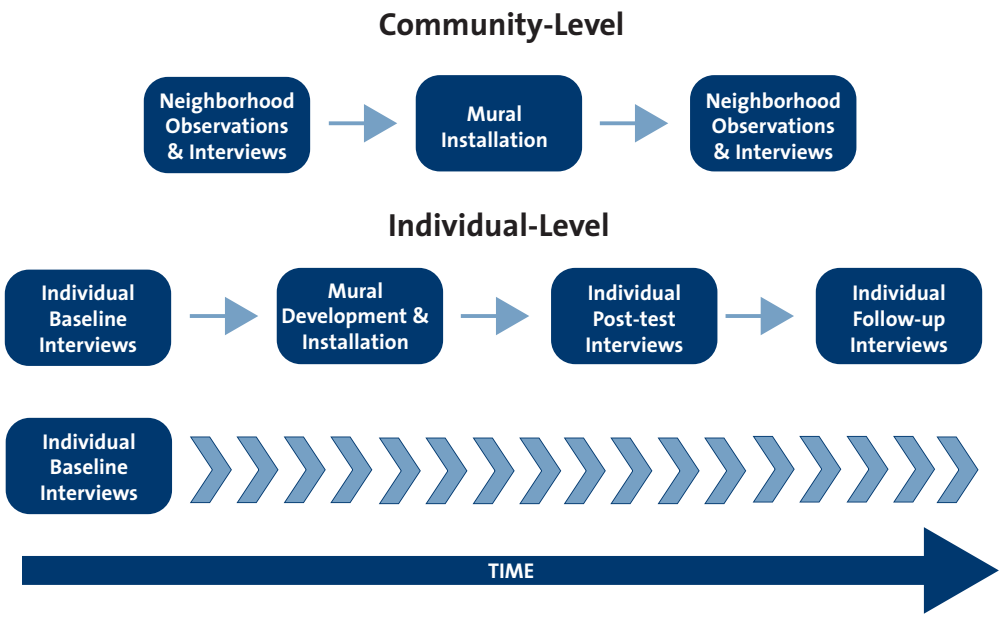
By ensuring that matched pairs of agencies were comparable in the populations served and in neighborhood characteristics, the mural and comparison conditions were expected to be equivalent overall. To provide a check on the comparability of matching agency populations and neighborhoods, we collected two additional sources of information. First, we obtained data on client demographic characteristics in matched agency sites (gender, age, race/ethnicity, household income) as well as symptom scores (overall psychiatric symptoms and depression). Second, we completed systematic observations of neighborhood decay and disorder throughout the evaluation period. Comparisons of matched agencies and neighborhoods using both sets of data showed that these matched pairs were comparable; however, we also used these data as statistical controls in completing community-level and individual level data analyses to examine differences in outcomes for the mural and comparison conditions.

Figure 3 provides a schematic overview of the Porch Light evaluation design. As shown in the figure below, the evaluation included community- and individual-level components. At the community-level we conducted neighborhood observations and interviews before and after installation of murals; at the individual level, we conducted interviews at baseline (when individuals enrolled in Porch Light and at an equivalent time in comparison site agencies), and at post-test after mural workshops ended and installation was underway. A final interview was then sought 4-6 months after mural installation; an equivalent set of interviews were then completed among PCHP participants in the comparison sites.

Neighborhoods and Agencies

Four agencies agreed to participate in the Porch Light Program: Asociación Puertorriqueños en Marcha, Inc. (APM), Sobriety Through Outpatient (STOP), Project H.O.M.E. (through a family housing site not disclosed here), and 11th Street Family Health Services of Drexel University (11th Street). Two agencies, APM and STOP, created and installed Porch Light murals in two consecutive years, and

Figure 3. Overview of the Porch Light Evaluation Design



Project H.O.M.E. and 11th Street each created one mural in successive program years. As described earlier, comparison agencies in identified neighborhoods were then invited into the larger PCHP study.

Table 1 shows Porch Light and PCHP neighborhoods and agencies. All neighborhoods were located in North Philadelphia except for Belmont/Haverford North in West Philadelphia. As shown, Juniata Community Mental Health

Table 1. Neighborhoods and Agencies in the Porch Light Evaluation

Philadelphia Neighborhood	Agency	Evaluation Condition
Fairhill (19140)	Asociación Puertorriqueños en Marcha, Inc. (APM; clinic site) 3263 North Front Street	Porch Light
Fairhill/Hartranft (19140)	Juniata Community Mental Health Clinic (Juniata; clinic site) 2637 N. 5th Street	PCHP Comparison
Glenwood (19132)	Sobriety Through Outpatient (STOP; clinic site) 2534 North Broad Street	Porch Light
Tioga (19141)	Wedge Recovery Centers (Wedge; clinic site) 3609 North Broad Street	PCHP Comparison
Poplar (19123)	11th Street Family Health Services of Drexel University (11th Street; clinic site) 850 North 11th Street	Porch Light
Tabor (19141)	WES Health System of Philadelphia (WES; clinic site) 1315 Windrim Avenue	PCHP Comparison
Brewerytown/Strawberry Mansion (19121)	Neighborhood only; Project H.O.M.E. (an undisclosed family housing site) 2417 Ridge Avenue (site of mural)	Porch Light
Belmont/Haverford North (19104)	Neighborhood only; (undisclosed DMHAS-funded youth program site) 4111 Lancaster Avenue (site of outdoor interviews & observations)	PCHP Comparison

Clinic, located in the Fairhill/Hartranft neighborhood, was matched to APM, also in the Fairhill neighborhood. Wedge Recovery Centers on North Broad Street in the Tioga neighborhood, was matched to STOP in the Glenwood neighborhood. WES Health System of Philadelphia on Windrim Avenue in the Tabor neighborhood was matched to 11th Street in the Poplar neighborhood. And finally, a Project H.O.M.E. family housing program for parents in recovery served as an agency site for Porch Light (and a pilot program for parents and youth who created a mural). Although some Porch Light activities were held at the housing site, most took place at the Hank Gathers Recreation Center. The Center is located within a mile of the housing site and the mural location on Ridge Avenue. This neighborhood was matched with the Belmont/Haverford North neighborhood, which had comparable risk indicators and racial/ethnic composition; a DBHIDS-funded youth program was also located in that comparison neighborhood. Other details on neighborhood comparability are in Appendix Table A1.

"The Color of Your Voice" Porch Light Initiative Year 2 ©2012 City of Philadelphia Mural Arts Program/Ernel Martinez, Keir Johnston, and Nina "Lyraspect" Ball, 2417 Ridge Avenue.

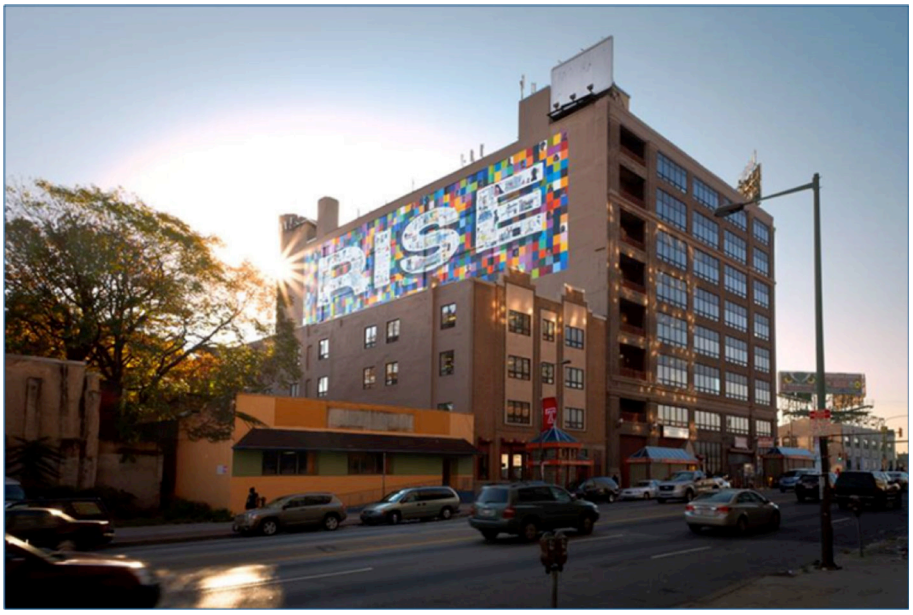
Murals

Six murals were completed for the Porch Light evaluation; five were assessed for neighborhood impact and five for individual impact. Table 2 lists each Porch Light mural included in the evaluation; their photos are shown in subsequent pages. *The Color of Your Voice* in the Brewerytown/Strawberry Mansion neighborhood was assessed for neighborhood impact only, and *A Healing Home* (installed on a school playground asphalt just outside evaluation boundaries) in the Poplar neighborhood was assessed for individual impact only. Two sets of murals – *It Has To Be From Here, Forgotten But Unshaken* and *Aqui Se Respira Lucha* as well as *Our Vision, Our Testament* and *The North Philadelphia Beacon Project* – were installed in successive years in the Fairhill and Glenwood neighborhoods, respectively. (All photos are by Steve Weinik).

Table 2. Murals in the Porch Light Evaluation

Mural Title, Artists & Agency	Mural Address	Evaluation Level
The Color of Your Voice by Keir Johnston, Ernel Martinez, and Nina "Lyraspect" Ball with participants from Project HOME	2417 Ridge Avenue	Community only
Our Vision, Our Testament and The North Philadelphia Beacon Project by James Burns with participants from Sobriety Through OutPatient, Inc, or STOP	2534 North Broad Street & 2701 North Broad Street	Community; Individual
It Has To Be From Here, Forgotten But Unshaken and *Aqui Se Respira Lucha* by Betsy Casañas with participants from Asociación Puertorriqueños en Marcha, Inc., or APM	3263 North Front Street & North Front Street between Westmoreland and Allegheny	Community; Individual
A Healing Home by Ben Volta with participants from 11th Street Family Health Services of Drexel University	1100 Melon Street	Individual only

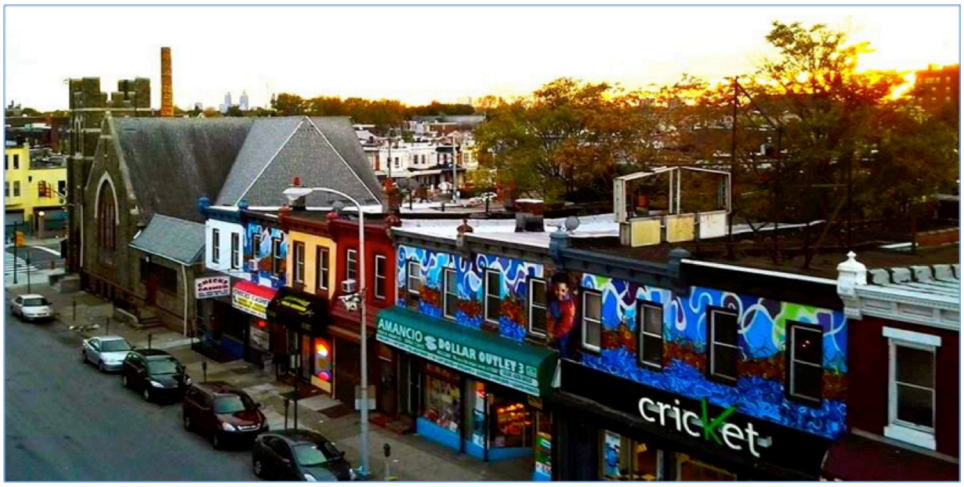
"Our Vision, Our Testament" Porch Light Initiative Year 2 © 2012 City of Philadelphia Mural Arts Program/James Burns, Sobriety Through Outpatient (S.T.O.P.), 2534 N. Broad Street.



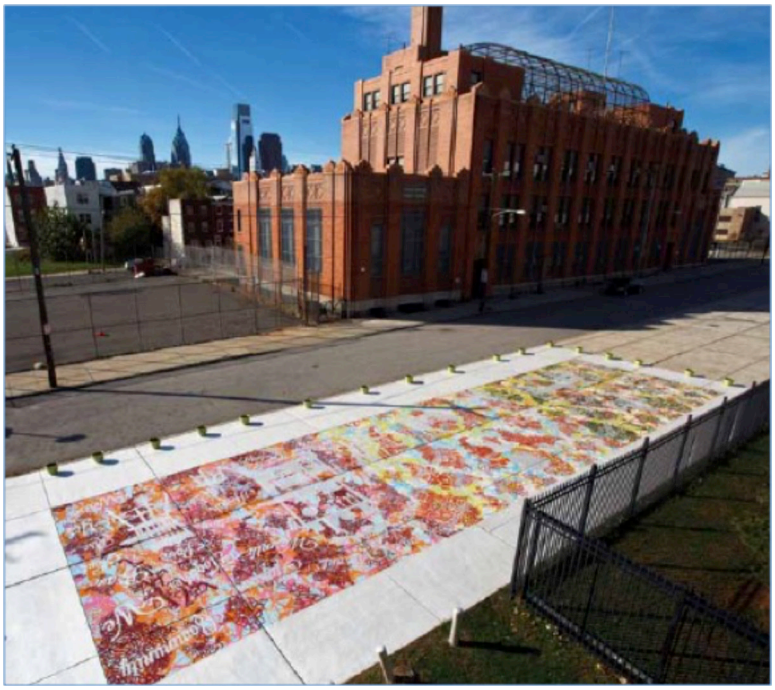
"The North Philadelphia Beacon Project" Porch Light Initiative, Year 3 © 2013 City of Philadelphia Mural Arts Program/James Burns, 2701 N. Broad Street..

"The North Philadelphia Beacon Project" Porch Light Initiative, Year 3 © 2013 City of Philadelphia Mural Arts Program/James Burns, 2701 N. Broad Street.

"It Has to be From Here, Forgotten But Unshaken" Porch Light Initiative Year 2©2012 City of Philadelphia Mural Arts Program/Betsy Casañas, APM Health Clinic, 3263 N. Front Street.



"Aqui se respira lucha" Porch Light Initiative Year 3©2013 City of Philadelphia Mural Arts Program/Betsy Casañas, Front Street between Allegheny Avenue and Westmoreland Street.



"A Healing Home" ©2013 City of Philadelphia Mural Arts Program/Benjamin Volta, 1100 Melon Street.

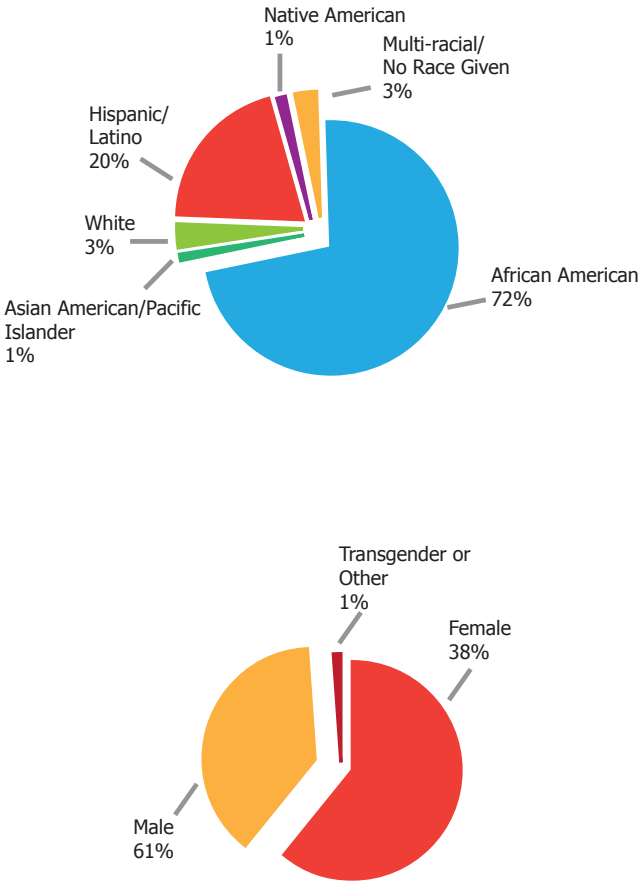
Community-Level Evaluation

Methods

Participants. We completed 1,325 person-on-the-street interviews with residents in the six neighborhood sites[2]. A total of 490 interviews were conducted at the initial baseline (252 mural; 238 comparison); 474 after installation of the October 2012 murals (243 mural; 231 comparison); and 361 after installation of the October 2013 murals (201 mural; 160 comparison). Figure 4 shows that 72% of residents identified as African American, 20% Hispanic/Latino[3], 3% White, 1% Native American, .6% Asian/Pacific Islander, and 3% Multi-racial/No race. Also, 61% reported their gender as male, 38% female, and .6% Transgender/Other. There were no differences across mural and comparison sites by gender and race, but there were proportionately more residents interviewed in mural sites who were of Hispanic/Latino ethnicity (30% vs. 9%).

Procedures. To conduct interviews in each neighborhood, we first identified three intersections within one-half to one mile of one another on the main street where each agency was located. In most instances, a mural installation was planned for that street at one of those intersections. The central intersection was always located in front of the initial planned mural site, and the other two intersections were located within one-half mile or less on either side of that intersection. A comparable set of intersections were then selected in the matched comparison neighborhood. Interviews were conducted on at least one weekday and one weekend day between the hours of 12:00 p.m. and 6:00 p.m. about 8-12 months apart. Interviews after mural installations were usually conducted during the following spring and summer in both mural and comparison sites. Interviews were not conducted in inclement weather, such as rain or snow, or when temperatures were below 40 or over 90 degrees Fahrenheit. Interview intersections are listed in Appendix Table A2.

Figure 4. Race/Ethnicity and Gender of Residents Interviewed (n=1,325)



After asking prospective participants whether they lived within a mile of the intersection where the interview was held, residents provided their consent to participate in a study about their perceptions of the neighborhood. Interviews were conducted in English or Spanish by trained interviewers using a semi-structured protocol. All interviews were anonymous and took about 8-15 minutes to complete for which residents were paid two SEPTA tokens (equivalent to about $3.60). During the interview, residents were given a set of laminated response cards that they could use to follow along and give responses using words or numbers. The interviewer read each question or statement in order to sustain rapport and to minimize difficulties reading or in interpreting items.

Measures. For the Porch Light evaluation, interviewers initially asked residents to identify the "best thing" and "worst

2 This total does not include 306 resident interviews (153 each in the Poplar and Tabor neighborhoods, respectively) that were completed before and after installation of *A Healing Home* in the Poplar neighborhood near 11th Street Family Health Services. A few months before planned mural installation in that neighborhood, this mural was not approved for building installation; alternatively, it was installed on the asphalt of a school playground just outside of the neighborhood site boundaries. Thus, the community-level data from these interviews were not included in the Porch Light evaluation but will be included with other additional neighborhood community interviews in the PCHP final report.

3 Racial/ethnic categories were combined with Hispanic/Latino such that African-American, Asian-American/Pacific Islander, Native American, and White categories are all non-Hispanic/Latino.

thing" about their neighborhood and then to respond to several standardized measures, including neighborhood collective efficacy (Sampson et al., 1997), neighborhood aesthetic quality (Mujahid et al., 2007), and behavioral health stigma (Link et al., 1997). Residents were then asked to share their opinions about public murals and to rate them. The interview concluded by asking residents their gender, race, and ethnicity. Table 3 below shows each construct assessed and the specific measures used. Measures had well-established reliability and validity, although one measure that had residents rate the aesthetic quality of buildings (Tebes & Matlin, 2011), was developed specifically for this evaluation. All measures showed strong reliability (Cronbach's $\propto \geq .67$) in the current sample of community participants. Further details about the community interview measures are provided in Appendix Table A3A.

Systematic Social Observations of Neighborhoods. Since no two neighborhoods are exactly alike, we also completed systematic social observations of neighborhood characteristics. We based this work on pioneering research from the Project in Human Development in Chicago Neighborhoods (Sampson et al., 1997; Sampson & Raudenbush, 2004). Our intent was to select representative indicators of neighborhood decay and disorder that are known to be associated with health risks and could be statistically taken into account in the community-level analyses. We used established measures to assess three major types of neighborhood characteristics: physical disorder (e.g., graffiti, trash, litter, drug needles and paraphernalia, condoms), social disorder (e.g., public drinking, fighting/arguing, loitering, selling drugs, street prostitutes), and physical decay (e.g., condition of residential and commercial buildings, boarded-up windows, abandoned buildings, vacant lots).

Intersections selected for interviews served as the organizing location for conducting systematic social observations for that neighborhood. We used trained observers to conduct observations by walking street blocks within a one-half mile radius of the central intersection at each site. The unique configuration of blocks at each neighborhood site determined exactly which block faces (one-side of the street within a block) were observed. Across the six neighborhoods in the Porch Light community-level evaluation, observers walked a total of 13-27 blocks per site (detailed in Appendix Table A2). Each mural neighborhood site was observed before and after the installation of a mural, and at a comparable period in the comparison neighborhood sites. Observations for each period were done on two occasions, once on a week day and once on a weekend, between the hours of 12:00 p.m. and 6:00 p.m., as was the case for community interviews. Once again, observations were never done in inclement weather, and were typically conducted within weeks of one another in mural and comparison neighborhoods. Also, every effort was made to complete observations within weeks of resident interviews at that site, but never at the exact same time. Intra-rater reliability was assessed at the beginning and throughout data collection, and was very good ($K \geq .85$). Since systematic social observations were done to ensure the comparability of mural and comparison neighborhoods and to statistically control for neighborhood differences in the community-level evaluation, further details on neighborhood observations are provided in the PCHP final report.

Table 3. Community Interview Constructs, Measures, and their Reliability in the Porch Light Evaluation

Construct	Measures Used in the Porch Light Evaluation	Reliability*
Neighborhood Collective Efficacy	Social Cohesion and Trust (Sampson et al., 1997)	.67
	Informal Social Control (Sampson et al., 1997)	.80
Neighborhood Aesthetic Quality	Overall Neighborhood Aesthetic Quality (Mujahid et al., 2007)	.77
	Quality of the Walking Environment (Mujahid et al., 2007)	.74
	Aesthetic Ratings of Specific Buildings (Tebes & Matlin, 2011)	.91
	Perceived Neighborhood Safety (Mujahid et al., 2007)	.67
Behavioral Health Stigma	Stigma Devaluation Discrimination Scale (Link et al., 1997)	.76
Demographic Information	Gender, Race, Ethnicity (Latino/Hispanic)	--
Neighborhood Preference Items	Neighborhood "best thing" and "worst thing" (coding adapted from Sampson et al., 1997)	--
	Rating of public murals (Tebes & Matlin, 2011)	--

Results

We begin with residents' own words about their neighborhood and about Philadelphia murals, and then summarize the results of the community-level outcome evaluation.

Residents' Opinions about their Neighborhood and Public Murals. All residents were asked to describe the "best thing" and "worst thing" about living in their neighborhood, and their results were coded using a checklist adapted from the Project in Human Development in Chicago Neighborhoods (Sampson et al., 1997). About one-half (48%) noted the inexpensive cost of living as the "best thing" about their neighborhood, 26% identified good public transportation, and 24% their access to shopping, restaurants, and other facilities. About one-fifth (19%) remarked that the "best thing" was that they grew up or lived in the neighborhood their entire life; and 12% said that they liked the people there. (Residents could identify more than one preference.) "Worst thing" responses included: crime (30%), drugs (28%), excessive violence/gangs (19%), and pollution (13%; such as trash, noise, traffic, a "dirty neighborhood").

At the end of the interview, residents were also asked whether they noticed "any public art on the walls or buildings" in their neighborhood and what they thought of it. Virtually every resident acknowledged seeing public art, usually a mural, either in their neighborhood or elsewhere in Philadelphia. They were also asked to rate any murals they identified on a 7-point scale (7=Thumbs up and 1=Thumbs down). Residents' ratings were high, with a mean score of 5.34 (S.D.=2.10). When giving their opinion about murals, the vast majority had positive things to say, although a small minority disliked them. For example, one resident referred to murals as "graffiti" and another that they are a "…band-aid (that) covers up things that need to be done."

However, these critical responses were by far the exception, and most residents spoke positively about what murals meant to them and noted that they often told a story. A qualitative content analysis of resident responses revealed four primary overlapping themes. Residents indicate that murals: 1) enhance the neighborhood aesthetically; 2) lessen neighborhood decay; 3) are inspiring and emotionally uplifting; and 4) build community. Several representative verbatim responses for each theme are shown in Table 4.

Impact of Porch Light on Community Outcomes at One Year. We examined community outcomes for collective efficacy, neighborhood aesthetic quality, and behavioral health stigma by comparing before and after scores of residents' perceptions using analysis of covariance. Since interviews were conducted 4-8 months after a mural dedication, and murals took 2-3 months to install, the results are applicable to approximately one year. We conducted analyses at one year for three sites (APM in the Fairhill neighborhood, STOP in Glenwood, and HOME in Brewer/Strawberry Mansion), and for two sites at two years (APM in Fairhill and STOP in Glenwood). For each analysis, we statistically controlled for differences in neighborhood decay and disorder and for the neighborhood intersections where interviews took place. This allowed us to generalize results across neighborhoods and to individuals in a given neighborhood even if interviews were completed at intersections away from a Porch Light mural.

Table 4. Themes and Representative Quotes from Residents about the Impact of Neighborhood Murals

Enhance the Neighborhood Aesthetically
"They're beautiful." *"It showcases the community, enhances the beauty of the neighborhood."* *"It's gorgeous. Totally changed the street."* *"Makes neighborhood attractive. Brings in people from outside the neighborhood."* *"It's a Philly treasure! I wish they had more in this neighborhood."*
Lessen Neighborhood Decay
"It makes the neighborhood feel less run down." *"Most of the buildings are abandoned; the art is nice."* *"I like it; just something better than graffiti."* *"When people see it, they know what people love about the neighborhood."* *"Gives you something better than trash."* *"It makes the neighborhood look better."* *"It's the neighborhood come to life; contrasts the bad parts."*
Are Inspiring and Emotionally Uplifting
"The murals inspire me." *"They show people in the neighborhood that are doing something with their life that was positive."* *"Makes me feel brand new and alive."* *"It gives you a sense of hope and happiness."* *"It brings a good thought; positive, inspiring."* *"Makes your spirit lift. It makes me happy."* *"I like the art and most have a message like courage and what someone did."*
Build Community
"It tells about the culture, history, and potential of the people." *"It brings positivity to the community."* *"Brings out some good in the neighborhood."* *"I think it's uplifting for the people in the neighborhood."* *"Peaceful. Brings community."* *"Most who are in recovery do this art. I'm very impressed."*

Table 5 shows means, standard deviations, the test statistic (F), and the probability (p) that the results were due to chance. We interpret results as statistically significant when the probability level is .05 or less; results with a probability of less than .10 due to chance are a promising "trend level" effect. We use the phrase "a *relative* increase" or "a *relative* decrease" to describe a statistical difference between mural and comparison neighborhoods. The word *relative* denotes that scores increased or decreased *relative to one another*, even though both scores may have increased or decreased in any given analysis.

As shown in the table, over the course of approximately one year, residents living within one mile of a newly installed mural reported:

- A relative increase in collective efficacy, including social cohesion and trust among neighbors as well as informal social control.
- A relative increase in neighborhood aesthetic quality, including overall aesthetic quality, the walking environment, ratings of specific buildings, and perceived neighborhood safety.
- A relative decrease (at a trend level) in feelings of stigma toward individuals with mental health or substance abuse challenges.

These results show dramatic effects on neighborhood collective efficacy (cohesion and trust combined with informal social control) and neighborhood aesthetic quality for residents in mural neighborhoods, and trend level effects on behavioral health stigma. They indicate that within six months after the installation of a new mural, residents' perceptions of their neighborhood change to protect them from health risks associated with neighborhood decay and disorder. We also show these results graphically in Figures 5-10.

Thus, with the exception of a trend level effect on behavioral health stigma, these results show that Porch Light murals have a short-term protective health impact on residents' perceptions of their neighborhood.

Table 5. Impact of Porch Light on Residents' Perceptions of Neighborhood Collective Efficacy, Neighborhood Aesthetic Quality, and Behavioral Health Stigma at One Year

	Mural Neighborhoods				Comparison Neighborhoods					
	Pre 2012 Mural		Post 2012 Mural		Pre 2012 Assessment		Post 2012 Assessment			
Variable	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***F***	***p***
Neighborhood Collective Efficacy										
Perceived Social Cohesion & Trust	9.10	.19	9.64	.18	9.28	.18	8.82	.18	8.06	.005
Perceived Informal Control	15.74	.39	17.21	.36	15.90	.37	15.54	.36	6.50	.011
Neighborhood Aesthetic Quality										
Overall Neighborhood Aesthetic Quality	15.08	.33	17.06	.31	16.90	.31	14.92	.31	22.01	.000
Quality of the Walking Environment	22.52	.37	23.58	.40	22.48	.35	21.49	.35	8.91	.003
Aesthetic Ratings of Specific Buildings	10.10	.42	13.87	.39	7.98	.39	8.93	.39	13.19	.000
Perceived Neighborhood Safety	4.20	.19	5.16	.17	4.45	.18	4.09	.18	14.17	.000
Behavioral Health Stigma										
	26.80	.42	26.09	.39	25.87	.40	26.62	.40	3.39	.066

N = 940.

Figure 5. Impact of Porch Light on Social Cohesion and Trust among Neighbors at One Year

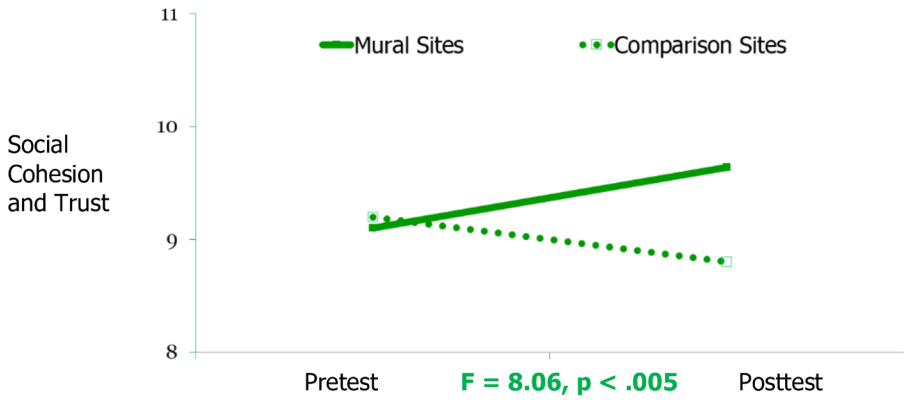


Figure 6. Impact of Porch Light on Informal Social Control among Neighbors at One Year

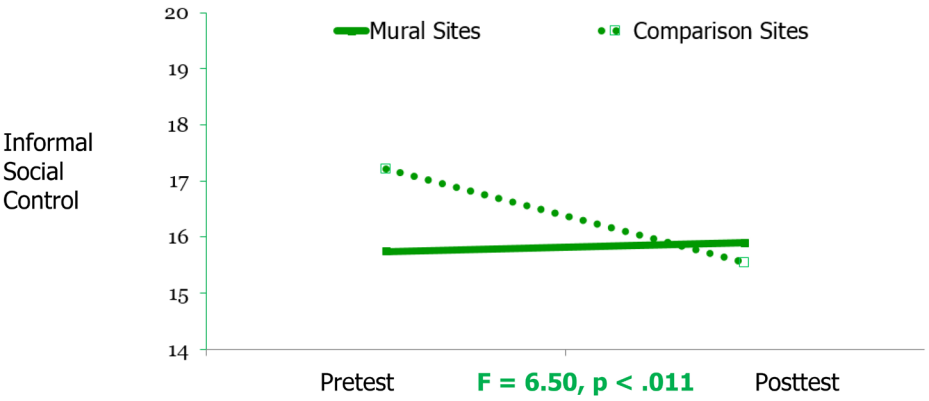


Figure 7. Impact of Porch Light on Overall Neighborhood Aesthetic Quality at One Year

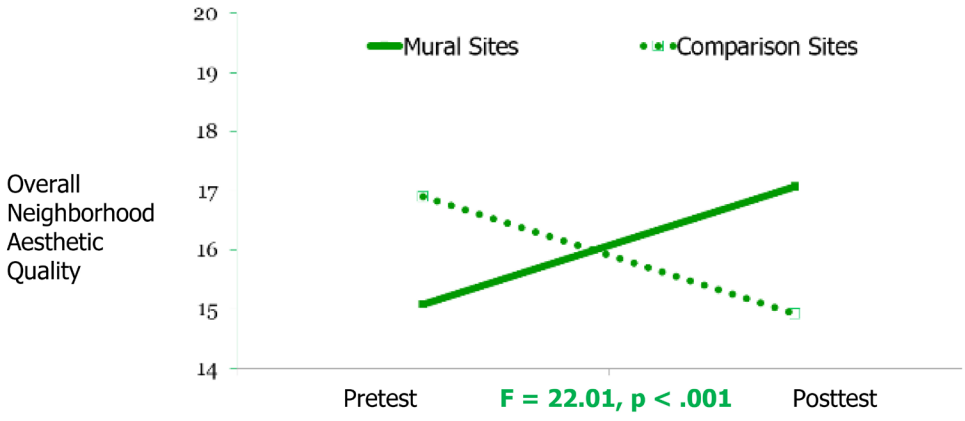


Figure 8. Impact of Porch Light on the Neighborhood Walking Environment at One Year

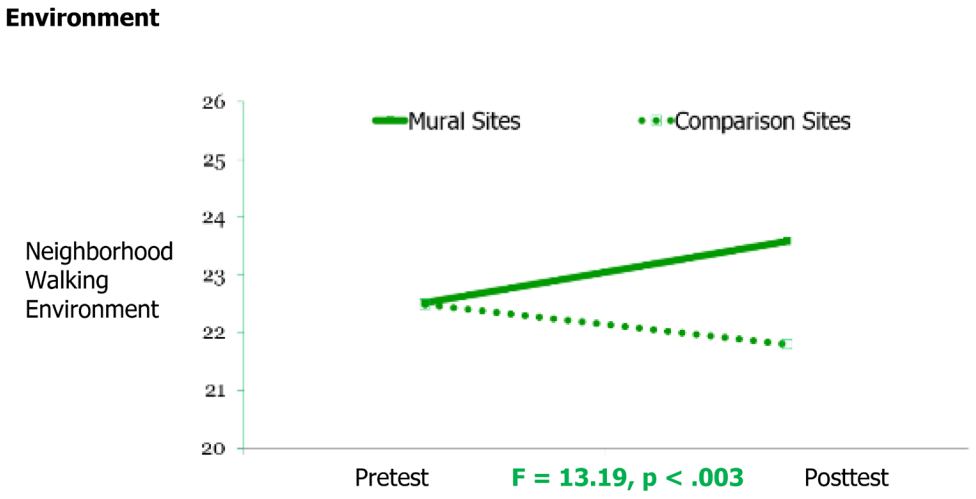


Figure 9. Impact of Porch Light on Perceptions of Neighorhood Safety at One Year

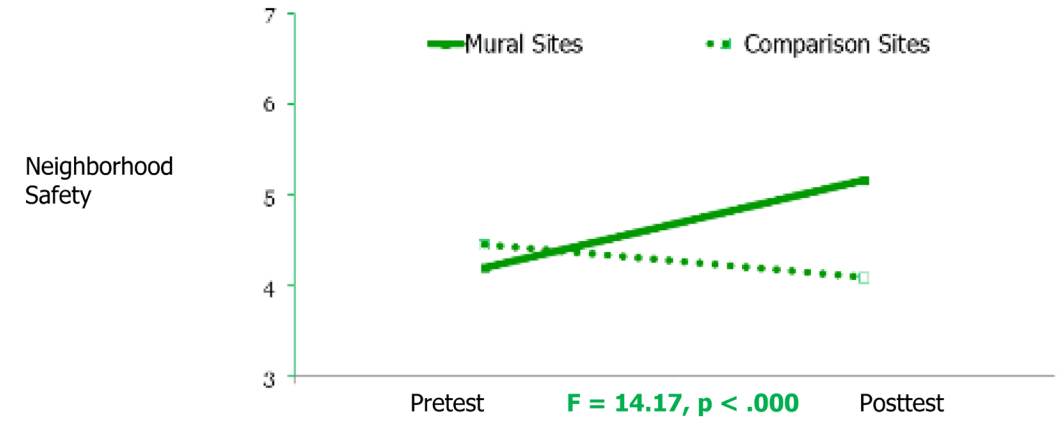
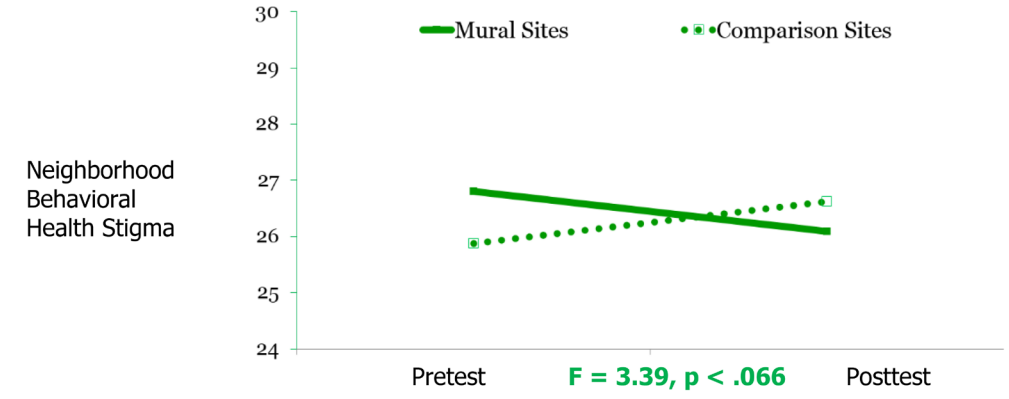


Figure 10. Impact of Porch Light on Neighborhood Behavioral Health Stigma at One Year



Impact of Porch Light on Community Outcomes at Two Years. We also assessed the impact of two or more murals as a cluster in the same neighborhood. These analyses also were done using analysis of covariance, with statistical controls for differences across neighborhoods in decay and disorder as well as differences within neighborhoods for the specific intersection where interviews took place. Table 6 shows the results.

After almost two years, residents living within one mile of more than one newly installed mural reported:

- A continued relative increase in collective efficacy, including social cohesion and trust among neighbors as well as informal neighborhood social control.
- A modest sustained relative increase in perceptions of neighborhood aesthetic quality, including the quality of the walking environment and perceived neighborhood safety.
- A promising and sustained relative decrease (again at a trend level) in feelings of stigma toward individuals with mental health or substance abuse challenges.

We also completed analyses that showed the relative effects of changes across each assessment period: Pre-2012 murals (Spring/Summer 2012[4]), Post-2012 murals (Spring/Summer 2013), and Post-2013 murals (Spring/Summer 2014). In Table 7, we show the effect sizes for each of these outcome analyses for each time period. An effect size provides a standard estimate of the magnitude of specific relationships; in this case, it shows how much impact mural installation has on specific community-level outcomes at each time period. The effect size statistic we calculated was Cohen's *d*, which is a common metric used to compare the impact of social and health interventions.

Effect sizes can have both positive or negative values, and for Cohen's *d* a value of plus or minus (±) .20 is considered "small", ±.50 "medium" and ±.80 "large." To understand what this means in the context of the Porch Light evaluation, a value of ±.20 means that 58% of adult residents in a

4 During the pilot year, 104 community interviews were completed in summer and fall 2011 (out of 490 pre-2012 mural interviews completed). No significant baseline differences were observed between these and other pre-2012 interviews completed, and so these interviews were included in the overall pre-2012 sample in the analyses.

Table 6. Impact of Porch Light on Neighborhood Perceptions of Collective Efficacy, Aesthetic Quality, and Behavioral Health Stigma at Two Years N = 961.

	Mural Neighborhoods				Comparison Neighborhoods					
	Pre 2012 Mural		Post 2013 Mural		Pre 2012 Assessment		Post 2013 Assessment			
Variable	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***F***	***p***
Neighborhood Collective Efficacy										
Perceived Social Cohesion & Trust	8.91	.20	9.74	.18	9.41	.22	8.71	.20	15.15	.000
Perceived Informal Control	14.88	.44	15.80	.36	16.37	.43	15.78	.41	3.65	.057
Neighborhood Aesthetic Quality										
Overall Neighborhood Aesthetic Quality	14.32	.38	16.02	.31	15.96	.38	16.75	.35	1.85	.175
Quality of Walking Environment	21.91	.41	23.20	.34	22.76	.41	22.72	.38	3.20	.074
Aesthetic Quality Ratings of Buildings	10.61	.50	13.66	.42	7.70	.50	11.70	.47	1.12	.293
Perceived Neighborhood Safety	4.21	.23	4.76	.19	4.57	.23	4.14	.21	5.88	.016
Behavioral Health Stigma										
Stigma	26.59	.46	25.91	.38	25.47	.45	26.74	.43	5.57	.019

Table 7. Effect Sizes Comparisons of Key Community-Level Outcomes at Two Years

	Cohen's *d**		
Outcome	**$Time_1$ –$Time_2$**	**$Time_2$ –$Time_3$**	**$Time_1$ –$Time_3$**
Neighborhood Collective Efficacy			
Social Cohesion & Trust	.37	.18	.54
Informal Social Control	.32	-.17	.16
Neighborhood Aesthetic Quality			
Overall Neighborhood Aesthetic Quality	.68	-.49	.18
Quality of the Walking Environment	.43	-.15	.28
Aesthetic Ratings of Specific Buildings	.61	-.48	.12
Perceived Neighborhood Safety	.49	-.09	.40

N = T1 = 468, T2 = 472, T3 = 461. Note. *Cohen's *d* is a calculation of the magnitude of a given effect. Values refer to these approximate qualitative effect sizes: .20± = small, .50± = medium, .80± = large. Positive values denote an increase in an outcome; negative values a decrease.

mural neighborhood would have a score on an outcome measure that is higher than residents from a comparison neighborhood. Effect sizes of just over ±.50 mean that 70% or more of adult mural neighborhood residents would have higher scores on that outcome, and thus be more protected from health risks. Thus, if the goal is to reduce health risks at the population level, a small success would involve scores around ±.20 and a substantial success would yield scores of ±.50 or higher.

As Table 7 shows, within one year (Time 1 – Time 2) mural neighborhoods showed small to medium effects for collective efficacy, medium to large effects for aesthetic quality, and small effects for behavioral health stigma. However, within two years (Time 1 – Time 3), social cohesion and trust continue to increase while informal social control decreases. In addition, the aesthetic quality of the neighborhood mostly decreases so that most outcomes are relatively small, with but one exception – perceived safety, which continues to show a small to medium effect (.40). Finally, behavioral health stigma also continues to increase so that it shows a small to medium effect.[5]

These analyses cannot reveal whether the effects observed across two years is due to the passage of time or because more than one mural was installed in a particular neighborhood. The analyses do suggest, however, that installation of more than one mural nearby in a neighborhood in successive years has only a mixed benefit; neighborhood cohesion, perceptions of safety, and neighborhood behavioral health stigma actually increase, but informal social control and most changes in neighborhood aesthetic quality decrease. For example, in the case of collective efficacy, cohesion and trust increased significantly but informal social control decreased; in combination, however, there is likely a modest sustained collective efficacy effect. For neighborhood aesthetic quality, the results showed that most indicators decreased, some significantly. However, installation of a mural cluster appeared to increase perceptions of neighborhood safety. Finally, installing more than one mural resulted in a marked decrease in neighborhood behavioral health stigma. This may be due to the persistent involvement of behavioral health consumers and staff in Community Paint Days, the installation process, and in the mural dedication. These public involvements may have increased awareness of the messages of resilience, hope, and community connection evident as these pertain to mental health and substance abuse challenges. In this way, Porch Light murals may create a public narrative about mental health and substance abuse challenges that reduces stigma.

...installation of more than one mural nearby in a neighborhood in successive years has only a mixed benefit; neighborhood cohesion, perceptions of safety, and neighborhood behavioral health stigma actually increase, but informal social control and most changes in neighborhood aesthetic quality decrease.

5 We should caution that calculating several comparisons across each of these time periods may increase the liklihood of detecting a significant effect by chance alone. Concern about this risk is offset to some degree because the overall analyses at 1 year demonstrated such strong and consistent effects.

Individual-Level Evaluation

Methods

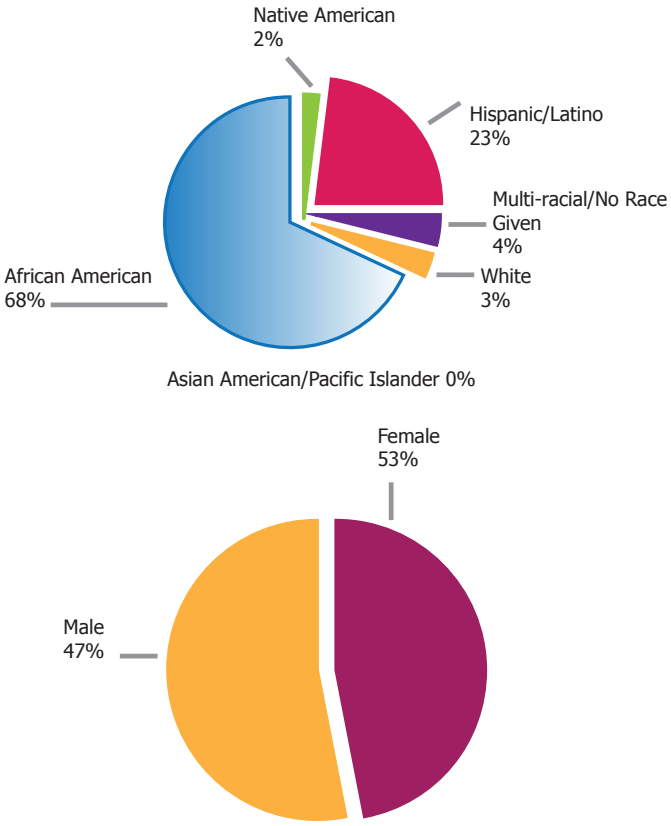
Over the two-year program period, three agency sites – APM, STOP, and 11th Street Family Health Services – conducted five groups of Porch Light Program workshops for adults receiving behavioral health services at their agency. Three agency sites – Juniata Community Mental Health Center, Wedge Recovery Centers, and WES Health System – served as comparison sites for each of these agencies, respectively. Porch Light programs conducted in each agency site were implemented as described in the Porch Light manual (Ansell et al., 2015). At APM and STOP, the program was conducted in successive years, and the results shown below are collapsed across both years for each of these sites.

Participants. A total of 264 individuals participated in the Porch Light individual-level evaluation (122 participants in Porch Light and 142 participants in PCHP); 54% of participants were female, 67% African American, 23% Hispanic/Latino, 3% white, 2% Native American, and 3% Multi-racial/No Race Given. On average, participants were 44 years of age, and most lived below the poverty level; 60% reported a household income of $10,000 or less and only 20% income of $20,000 or more. There were no differences on these characteristics between Porch Light and comparison groups.

We also assessed the comparability of participants recruited from the three pairs of clinic sites by examining baseline scores of psychiatric symptoms by Porch Light and comparison conditions. We compared two sets of scores, overall psychiatric symptoms and depressive symptoms, and both revealed no significant differences among participants recruited into the two conditions[6]. Thus, participants in each condition were found to be comparable across the mural and comparison conditions on both demographic and symptom characteristics.

Program Fidelity. An important component of any program evaluation is to determine whether and to what extent a program was implemented as intended. A program implemented properly has a better chance to be effective, assuming that one's underlying theory of change is correct. During the pilot year, the evaluation team completed observations of Porch Light workshop sessions in order to identify key program components to be tracked for assessing program fidelity. These observations indicated that there was considerable variability across Porch Light artists and agencies. This prompted discussions within the Steering Committee and at a Porch Light retreat of stakeholders

Figure 11. Race/Ethnicity and Gender of Participants Interviewed (n=264)



about instituting a common Porch Light implementation model. No such model could be agreed upon among artists and Mural Arts Program, and so common phases of program implementation were identified – Engage, Create, Generate – as detailed by Ansell et al. (2015) in the Porch Light manual. In addition, stakeholders identified 17 program activities in each of these phases that would be tracked for each workshop session, and common standards were developed for coding and counting activities across artists and sites. Activities identified included group formation, design discussions, painting, spoken word activities, and so on. Consistent with a CBPR approach (described earlier), artists would implement each phase as they saw fit given their artistic style, the participants enrolled, and the agency's organizational culture. Mural Arts staff and the workshop coordinator at each agency site would then monitor these activities as well as participant attendance, and provide these data to the evaluation team. Further details on Porch Light program implementation are provided in the Results.

Measures. For the individual-level evaluation, interviewers asked residents about their experiences of behavioral health stigma, recovery, stress, social support, and their engagement in recovery oriented services. All measures were

6 We used the BSI–18 (Derogatis, 2000) and the CESD-Short Form (Shrout & Yager, 1989; based on Radloff, 1977).

well-established and demonstrated very good reliability with the current sample. As noted above, participants also used several measures to assess the equivalence of the mural and comparison samples. These included standard items on gender, race, ethnicity, age, household income, as well as measures of psychiatric and depressive symptoms. Each measure, its published citation, and reliability is shown in Table 8, and additional detail is provided in Appendix Table A3B.

Procedures. Participants completed a private, one-hour interview at agency sites up to three times over the course of the evaluation – *Baseline:* when first enrolled in the study; *Post-test*: about 5-10 months later depending on their initial enrollment; and *Follow-up*: about 4-6 months later. The interview focused on participants' health, stresses and supports, experiences of stigma, perceptions of services, and perceptions of the agency neighborhood. Interviews were conducted by trained interviewers in English or Spanish as appropriate. Participants provided consent prior to each interview and received a $20 gift card per completed interview.

Results

As was the case for the community-level results, we report only statistically significant results in which the likelihood that a finding occurred by chance is 5% or less, or "trend level" results in which the likelihood of a chance finding is 6-10%. We also use the phrase "*a relative* increase" or "*a relative* decrease" to describe a statistically significant (or trend level) difference between mural site and comparison site participants. We use the word *relative* to denote that scores increased or decreased *relative to one another*, even though both scores may have increased or decreased in any given analysis.

Attrition Analyses. In general, Porch Light participants were more available for post-test or follow-up interviews than participants from comparison sites; that is, attrition was higher in the comparison condition. Figure 12 shows the flow of participants at each assessment period and indicates that for Porch Light, 23% of participants were unavailable for interviews at post-test as compared to 34% for comparison site participants, a trend level difference ($p < .052$) based on the chi-square test. At follow up, differential attrition for these two conditions was even more pronounced, with just over one-third (34%) of Porch Light participants not available for interviews vs. one-half of comparison participants, a statistically significant difference ($p < .007$). Despite these differences in attrition, when we compared baseline scores on demographic or evaluation outcome measures between Porch Light and comparison site participants, there were no significant differences on any of these measures. We discuss the potential implications of these findings in the Conclusions section.

Table 8. Individual Interview Constructs, Measures, and their Reliability in the Porch Light Evaluation

General Construct	Specific Construct and Measure	Reliability*
Behavioral Health Stigma	Perceived stigma: Devaluation Discrimination Scale (Link et al., 1997)	.84
	Stigma rejection experiences: Rejection Experiences Subscale (Link et al., 1997)	.76
	Use of secrecy to cope with stigma: Secrecy Coping Subscale (Link et al., 1997)	.70
Recovery	Empowerment: Empowerment Scale (Rogers et al., 1997)	.85
	Recovery Assessment: Recovery Assessment Scale (Giffort et al., 1995)	.87
Stress	Stress: Perceived Stress Scale (Cohen et al., 1983)	.83
Social Support	Social Support: Interpersonal Support Evaluation List (Cohen et al., 1985)	.84
Engagement in Recovery-oriented Services	Recovery-oriented services: Recovery Self-Assessment (O'Connell et al., 2005)	.97
Client Characteristics	Age, Gender, Race, Ethnicity, Household income (Standard survey items)	--
	Depression: Center for Epidemiological Studies Depression Scale (Radloff, 1977; CESD-D Short-Form (Shrout & Yager, 1989)	.87
	Psychiatric Symptoms: Brief Symptom Inventory (Derogatis, 2000)	.95

*Cronbach's alpha reliability.

Porch Light Attendance, Participation, and Program Fidelity. We examined Porch Light attendance, participation, and program fidelity for each site. Sites are identified as A, B, and C; the five Porch Light groups across sites are not identified. During the two program years, there were 25-34 sessions per site conducted over a 30-week period. We sought to schedule baseline interviews after a participant attended 1-2 sessions to minimize the chance that attending even a few sessions would impact health outcomes before the baseline interview was completed.

Figure 12. Attrition in the Porch Light Individual-Level Evaluation

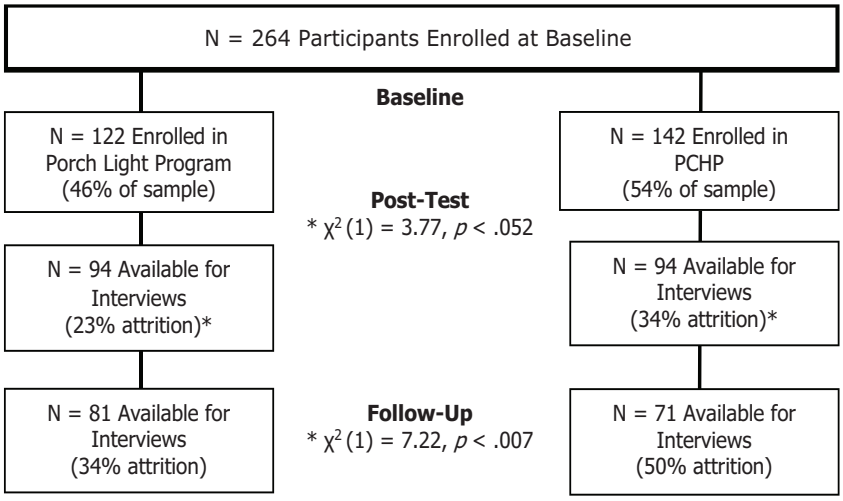


Table 9 shows the overall attendance by program site at enrollment, and then also before and after the baseline interview. As the table shows, there was considerable drop off in attendance in Sites B and C after the baseline interview was conducted. In Site B, the number of participants dropped by 51% (38 of 74) after the baseline was done, but those that did attend came to an average of about 7 sessions, or once every 2-3 weeks on average. In Site C, there was not only a drop of 42% from those who had enrolled and completed a baseline interview (10 of 24), but the average number of sessions attended by those who remained was low, just over 4 sessions (which means the average person attended workshops about every 4-5 weeks). Only in Site A was attendance relatively strong at almost 9 sessions per participant (about every other week), and the proportion of participants attending after baseline was high at 79% (19 of 24).

Another component of program fidelity, in addition to attendance and participation, is the amount and types of program activities conducted. Overall, workshop sessions were generally comparable in length across sites; about 90 minutes in Site A, 94 minutes in Site B, and 83 minutes in Site C, with a range of 60-180 minutes. Artists generally followed the three Porch Light phases: Engage, Create, and Generate (Ansell et al., 2015). Engage sessions focus on building relationships and trust within the group by recruiting members, creating group norms, design discussions, community trips, presentations, and sharing fellowship over food or snacks. The Create phase shifts attention to the art itself, through individual painting or artwork, individual or group writing, and spoken word. Lastly, the Generate phase focuses on mural completion, including paint preparation, mural painting/drawing, wood cutting/building, activities by guest artists, and planting/greening. Phases do not always flow sequentially since some activities, such as snacks, occur throughout the program to promote fellowship and relationship building.

Figure 13 shows the proportion of time in program activities during each phase by site. As can be seen, Site A emphasized the Engage (48%) and Create (41%) phases, with much less

Figure 13. Porch Light Program Phases by Site

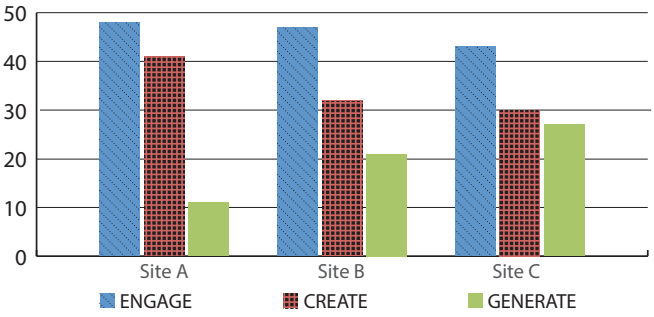


Table 9. Porch Light Attendance by Agency Site

	Overall Enrollment		Attendance Before Baseline Interview		Attendance After Baseline Interview	
Site	N	M (SD)	N	M (SD)	N	M (SD)
Site A	24	10.04 (6.51)	24	3.04 (1.57)	19	8.84 (5.67)
Site B	74	7.00 (9.23)	74	3.86 (3.57)	36	7.39 (9.05)
Site C	24	5.46 (8.01)	21	4.38 (4.17)	14	4.21 (5.74)

time spent on the Generate (11%) phase. In contrast, Site B mostly focused on the Generate phase (47%), with Engage (32%) and Create (21%) sharing about equal time. Site C spent similar amounts of time on each phase – Engage (43%), Generate (30%), and Create (27%).

Overall, the analyses of Porch Light attendance, participation, and program fidelity show that there was marked variability across sites not only in implementation, but in the likely experience of participants. At Site A, participants attended workshops about every other week and usually interacted with the same participants when they did attend. Much time was spent on building relationships and trust within the group, and on individual and group activities of artistic expression. In Site C, only a small number of participants attended regularly after enrolling, and those that attended did so infrequently. About equal time was spent on each phase. Site B was somewhere in the middle between A and C; although this site emphasized mural making, it also spent significant time building relationships and trust. Individuals who attended this site did so with some frequency, about every 2-3 weeks, but may not have had the same participants at most sessions.

Impact of Porch Light on Individual Outcomes. We compared the scores of participants in Porch Light and comparison sites on outcomes specified in the logic model. For these analyses, we used repeated measures mixed effects regression at baseline, post-test, and follow-up. Mixed effects regression is a powerful data analytic technique that allows for greater flexibility in examining results with the same participants over time. Although Porch Light and comparison group participants were comparable by gender, race, ethnicity, and age, to increase rigor, we controlled for gender, race, and ethnicity in the analyses as well as site and the number of Porch Light sessions attended before baseline. For these analyses, we only included participants who had attended at least one workshop before and after baseline. This resulted in a total sample size of 151 participants, and is known as the "per protocol" sample, because these participants had some intervention after the initial interview. (Appendix Table A4 shows analyses for the full "intent-to-treat" sample, which includes all participants, even those who did not attend workshops after the baseline interview. The results are comparable.)

Table 10 below shows the results from these (per protocol) analyses. As indicated by the probability level (p) in the right-most column, no predicted outcome was statistically significant, although there was an overall trend-level effect; Porch Light participants used less secrecy to cope with their stigma, a positive finding. No differences were observed for other stigma outcomes, recovery outcomes, stress and social support, and participants' engagement in recovery oriented services.

As was the case with the community-level analyses, we also examined effect sizes over time. This was especially important for the individual-level analyses because of the amount of attrition in the overall sample (43%). Individual-level at-

Table 10. Impact of Mural Making on Individual Outcomes – Per Protocol Sample

	Intervention						Control							
	Pre 2012 Mural		Post 2012 Mural		Post 2013 Mural		Pre 2012 Mural		Post 2012 Mural		Post 2013 Mural			
Variable	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***F***	***p***
Behavioral Health Stigma														
Perceived Stigma	21.62	1.19	25.19	1.12	24.62	1.30	22.44	0.87	26.56	0.81	25.83	0.95		
Stigma Rejection Experiences	1.04	0.24	1.06	0.25	1.08	0.25	1.31	0.17	1.53	0.18	1.68	0.18	0.77	0.46
Use of Secrecy to Cope with Stigma	1.20	0.22	1.28	0.22	1.11	0.25	1.32	0.16	1.50	0.16	1.83	0.19	2.84	0.06
Recovery														
Empowerment	28.29	1.25	29.37	1.26	28.52	1.35	26.43	0.89	27.88	0.91	26.73	0.98	0.86	0.92
Recovery Assessment Scale	33.82	0.75	32.87	0.74	33.37	0.79	34.93	0.54	33.96	0.54	34.55	0.58	0.01	0.93
Stress and Social Support														
Stress	21.06	1.23	21.06	1.26	20.36	1.28	21.25	0.89	21.27	0.91	22.02	0.93	0.85	0.43
Social Support	37.27	1.41	37.07	1.42	37.13	1.51	33.39	1.02	34.35	1.03	33.52	1.09	0.62	0.54
Engagement in Recovery-Oriented Services														
Recovery Self- Assessment	46.76	1.48	46.90	1.56	47.48	1.85	46.10	1.07	44.99	1.15	44.44	1.40	0.58	0.56

N=151. Note: All analyses controlled for: gender, ethnicity, race, and attendance before baseline. *F* and *p* values reported for group *X* time interactions.

trition made it more difficult to detect an effect even if one were present, and so examination of effect sizes is critical. Table 11 below shows effect sizes for each of the individual outcomes for each assessment period. Once again, the effect size statistic we calculated was Cohen's *d*. As shown in Table 11, effect sizes from baseline to post-test assessment were negligent or quite small (under ±20). Effect sizes from post-test to follow-up were also small, although the effect for use of secrecy to cope with social stigma increased to -.31 and the effect on stress increased (-.17) in the expected direction. The final comparison from baseline to follow up shows both a small to medium effect for use of secrecy to cope with social stigma and a small effect for experiencing less rejection due to social stigma, as expected. No other substantive potential effects of Porch Light were observed. Importantly, since these analyses were not significant they must be interpreted with caution, and in fact, making so many comparisons increases the likelihood of a finding an effect by chance. However, these analyses do indicate the potential value of looking more closely at site level analyses, despite an even smaller sample size, because of the wide variation in program implementation that was shown earlier.

Impact of Porch Light on Individual Outcomes: Exploratory Site-Based Analyses. Because of the wide variation in how the program was implemented across Porch Light sites, we conducted exploratory analyses to examine outcomes separately by site.

Site A

Site A implemented the program with the greatest fidelity; on average, about 80% of participants attended workshops about every other week. Thus, workshops activities were usually done with a common group of participants across many months. In Appendix Table A5, we show results from the same analyses completed with the entire sample but now only with the mural and comparison groups for Site A[7]. As is evidence from this table, the analyses for Site A were quite promising. Individuals who participated in Porch Light reported:

- A relative decrease in the use of secrecy to cope with behavioral health stigma.
- A trend-level relative decrease in the report of rejection experiences due to stigma.
- A relative decrease in stress.

Although no other significant effects were found for perceived stigma, recovery indicators, social support, or engagement in recovery-oriented services, the modest positive effects of the program are especially promising, given the small sample size available for these comparisons.

...when Porch Light is implemented consistently with a regular group of participants, it holds promise for promoting recovery and resilience at the individual level

7 These analyses are repeated measures mixed effects regression with statistical controls for any group differences due to gender, ethnicity, race, and attendance before baseline.

Table 11. Effect Sizes of Individual Outcomes at Each Assessment

	Cohen's *d*		
Variable	**$Time_1$ –$Time_2$**	**$Time_2$ –$Time_3$**	**$Time_1$ –$Time_3$**
Behavioral Health Stigma			
Perceived Stigma	-0.08	0.08	0.00
Stigma Rejection Experiences	-0.11	-0.09	-0.20
Use of Secrecy to Cope with Stigma	-0.04	-0.31	-0.35
Recovery			
Empowerment	-0.03	0.08	0.04
Recovery Assessment Scale	-0.01	-0.06	-0.07
Stress and Social Support			
Stress	0.01	-0.17	-0.16
Social Support	-0.16	0.02	-0.14
Engagement in Recovery-Oriented Services			
Recovery Self-Assessment	0.10	0.12	0.21

N = 151. Note. All analyses controlled for: gender, ethnicity, race, site, and attendance before baseline. Effect size calculated for groups with unequal sample sizes and a pre-post design.

Inspection of the effect sizes shown in Appendix Table A6 indicates potentially large effects on reductions in social stigma – reports of rejection experiences and use of secrecy to cope with stigma, and moderate effects on stress.

It is also important to consider two potential unintended adverse effects of the program revealed in Tables A5 and A6 on social support and engagement in recovery-oriented services. Although the analyses were not statistically significant, it first appears that, at least for recovery-oriented services, which showed a very large effect size, that participants reported a relative decrease in such services. To understand this possible effect, we examined the estimated marginal means in Table A5 over time. As shown in the table, participants in Site A reported very high engagement in recovery-oriented services at baseline, more than 25% higher than the comparison group (51.50 vs. 38.78). This suggests that the Site A was already providing recovery-oriented services that allowed for considerable consumer input into treatment planning, a hallmark of recover-oriented care. Over time, these scores decreased about 9% following Porch Light participation (51.50 to 46.98) to a level that was still higher than the comparison group ever reported. It is unclear why the comparison group increased over time on this indicator, but the slight drop in engagement to a still very high level is probably spurious. Comparison of the marginal means for social support tell a different story but also do not point to any real cause for concern about the unintended effects of Porch Light. Once again, Site A participants reported higher levels of social support at baseline (36.52 vs. 30.90, a 15% difference), which then decrease slightly over time to a level that is still higher than the comparison group ever reports.

Thus, overall, the results from the analyses of Site A are encouraging, and suggest that when Porch Light is implemented consistently with a regular group of participants, it holds promise for promoting recovery and resilience at the individual level.

Site B

We completed a similar set of analyses[8] for Site B which are summarized in Appendix Tables A7 and A8. As noted earlier, about one-half of Site B participants attended regularly, about every other week. However, since only half of program enrollees attended workshops after the baseline interview, participants likely did not attend sessions with mostly the same group of people, thus limiting relationship building and trust within the group. The results, which involved a slightly larger sample than found in Sites A or C, showed a relative decrease (at a trend level) in the use of secrecy to cope with behavioral health stigma and a relative increase in engagement in recovery-oriented services. No other differences in stigma, recovery, stress, and social support were found.

Examination of the effect sizes shows a moderate effect size for use of secrecy to cope with stigma and a strong effect for engagement in recovery-oriented services. When we examined the estimated marginal means for these effects in Table A7, they suggest an explanation for these two findings. First, there appears to be a robust decrease in the use of secrecy coping at follow-up in favor of Site B participants (1.14 to 1.22 to .87), which when combined with a sharp increase in the comparison group (1.22 to 1.08 to 1.58) resulted in the trend level effect. However, for engagement in recovery-oriented services, the apparently strong affect appears to be due mostly to a decrease in the comparison group over time, thus mitigating enthusiasm for the potential impact of Porch Light as an explanation for this effect.

Site C

Lastly, we completed the same analyses[9] for Site C, and summarized them in Appendix Tables A9 and A10. As shown, Table A9 shows no significant effects on any outcomes. In addition, Table A10 shows mostly modest effects, and when examined in combination with the estimated marginal means shown in Table A9, show little impact in favor of Porch Light except for one outcome: participants' reports of engagement in recovery-oriented services. Although the overall analyses were not significant, the moderate effect size (.54) was promising, especially when taking into account the estimated marginal means in Table A9. As shown in that table, Site C participants increased from baseline to follow up about 11% (46.13 to 51.43) in recovery-oriented services as compared to a 5% increase in the comparison group over the same period (43.10 to 45.30). Comments by Site C agency leadership during Porch Light retreats, Steering Committee meetings, and in various discussions suggested that the program provided the agency with a new way of engaging consumers beyond traditional services. Porch Light may thus have expanded opportunities for participant input into treatment planning which was reflected in reports of increased engagement in recovery-oriented services.

8 Again, these analyses are repeated measures mixed effects regression with statistical controls for any group differences due to gender, ethnicity, race, and attendance before baseline.

9 Again, these analyses are repeated measures mixed effects regression with statistical controls for any group differences due to gender, ethnicity, race, and attendance before baseline.

Case Study Interviews and Results. We also completed case study interviews with ten Porch Light participants, five of whom we followed longitudinally over the course of one year, to learn about their experience in the program. A qualitative longitudinal case study method captures individual processes of recovery as they unfold over time, thus providing a window into the "lived experience" of Porch Light participants.

The results of the case studies were recently published (Mohatt, Hunter, Matlin, Golden, Evans, & Tebes, 2015). Individuals invited to complete case study interviews were determined through participant observation of Porch Light workshops and discussions with agency lead artists. Participants needed to be able to communicate effectively and candidly about their personal experience in Porch Light. Three sets of case study interviews were completed across one year – shortly after participants enrolled in the workshops, immediately after the completion of the workshops, and 6-months after the installation and dedication of the murals. Participants provided consent for each interview for which they received $20 per interview.

Each case study interview used a semi-structured format with guiding questions that focused on: 1) whether and if so how Porch Light changed participants' views of themselves, others, their neighborhood, and life; 2) their experiences of working alongside other individuals with mental health and substance abuse challenges, and whether Porch Light affected their experiences of stigmatization; 3) whether Porch Light affected their perception of the agency where they received services; and 4) a general sense of what it was like to participate in the workshops. Interview notes and field notes from observations were then combined for each participant, which resulted in a detailed description for each interview.

These qualitative data were then analyzed using an existential-phenomenological approach which sought to establish a coherent story for each case based on participants' experiences (Mohatt et al., 2015). Two members of the evaluation research team then coded these descriptions independently, and engaged in an iterative process with the study team to identify themes by consensus.

The inconclusive individual quantitative results are offset by generally positive case study results. Table 12 summarizes four themes that consistently emerged in case study interviews as outcomes of the Porch Light program: friendship, sense of self, giving back, and hope. Below we describe the experiences of two case study participants – "Ben" and "Rose" – whose real names and circumstances are masked to protect their privacy (Mohatt et al., 2015).

Both Ben and Rose have a long history of substance abuse and mental health challenges, and describe a difficult early life of exposure to trauma and poverty. Each also describes how participation in Porch Light opened up new opportunities for friendship and self-discovery, which made them more hopeful about the future and desiring to give back to others or their community in new ways. The shift in their outlook was gradual, the result of regular and active participation in Porch Light. As Rose said in an early interview: "*Seeing the artists is inspiring. They came from nothing, now they doing this. They are striving, and making something of their lives. And helping people. Being role models. This is something you can do with your life that is positive.*" For both Ben and Rose, the relationship to the artist was a critical intermediate pathway to full program engagement. That relationship then became a vehicle for engaging with others in the program around the art and the shared task of giving back to their community through public art.

Central to Ben and Rose's stories of friendship was an emerging reciprocity with other participants, a give and take essential to group formation and relationship building. This give and take was further reflected in their group's focus on a public mural, one that involved giving back to their community. For both Ben and Rose, the desire to give back was also driven by self-discovery. For Ben, this process involved a developing an identity as an artist; for Rose, it was expressed in a new-found belief that she could create meaning and beauty in the world.

Both Ben and Rose found increased hope through Porch Light but in different ways. Rose came to see "mural arts" as a basis for doing "good" and "fixing up the community." It gave her hope for herself and her community. In one of his interviews, Ben talked about transforming negativity through art. In a subsequent interview, he described following a stepwise process for achieving his goals, such as going back to complete his education, and referred to the transformation from the negative to the process as part of that process that enabled him to turn his life around, with Porch Light as the fulcrum for doing so.

One issue requiring further study are the few reports of stigma by Ben and Rose, and by other case study participants interviewed. Despite being given ample opportunity to describe stigma due to mental health or substance abuse challenges, participants mostly focused on their experiences of friendship, self-discovery, giving back, and hope as a result of Porch Light, as well as their sense of agency and empowerment. Given that the individual-level findings showed modest effects on social stigma for participants who attended workshop regularly, we can only speculate that Porch Light may actually create a safe haven for par-

Table 12. Themes and Illustrative Quotes from Case Study Interviews of Porch Light Participants*

Theme	Description	Illustrative Quotes
Friendship	Descriptions of peer interactions and reflections on the meaning and nature of friendships	**Ben:** *"..the artist] always works with new people to help them feel comfortable. He gave that to me, made me feel comfortable, and helped me figure out how to do the project. So when new people come, I try to give them what [the artist] gave me."* **Rose:** *"I get to meet people, socialize. I don't like a lot of people around me, but now [the other participants] are like a family. I'm all giving out my number and stuff."*
Sense of self	Reflections on self-awareness and changes in self-concept	**Ben:** *"I am comfortable here. I was thinking, can I still paint? And I thought yes. It's blessings. I want to continue now long-term, continue to travel this journey, and meet new people. I might do art at home now. There is more to learn. I am looking for an outlet to take my mind away from the streets, to give myself something different. I found that here at [here], creativity is that outlet."* **Rose:** *"I thought, oh my god, this is me putting up a mural. Never would have thought that about me before. And here I am. Who would have thought I could make something . . . Deep inside there is something amazing that we can all do, something we can make. And [the artists] show you this, bring it out of you."*
Giving back	Contributing to one's community or what one has to offer the people around them	**Ben:** *"[The program] has helped me learn new things that I can take out of here. You see, once you find yourself people appreciate you for who you are . . . Now I can give back."* **Rose:** *"Well, I look at it as a savior. Before I was clean I couldn't love me. I robbed, stole, shot at people… I didn't care. I didn't love me. I just wanted to get my drugs, marijuana, crack. . . (Now) I can be one of those people who do something, a poet, a musician, talk to kids, have talent. I can do that. It let's you know . . . you can do something."*
Hope	Descriptions that exemplify or express an empowered and future-oriented sense of capability	**Ben:** *"I've always believed that anything can come true, but now I see the step process involved in getting there… I wanted to volunteer to be part of the art. It is soothing. Keeps my mind focused, keeps my mind clear and open. And I wanted to achieve my goals. Now it seems like I am going to get there."* **Rose:** *"I did think the community was too far gone, until I saw all these people coming. Why sit around and gossip when you can go to mural arts? I believe it, the mural, will do a lot of good. There are lot's of people doing it now. And it will inspire kids to get into something. And it's fixing up the community. It ain't just spray paint. It's real art, beautiful art. When I see it I think, wow, I did that."*

*Adapated from Mohatt et al. (2015)

ticipants – like the proverbial Porch Light that led to the program's name in the first place (Ansell et al., 2015) – so as to make stigma less of a salient issue. If participants feel accepted and valued by artists, peers, and agency staff, then they may feel less need to use secrecy to cope with stigma and will report fewer rejection experiences, which would be consistent with the individual-level findings.

Ben and Rose's stories provide opportunities for identifying potential mechanisms of change through participatory public art, and also whether public murals promote recovery and resilience among individuals with mental health and substance abuse challenges. Both Ben and Rose expressed amazement and wonder that they were part of creating something beautiful, meaningful, and permanent for their community. What is the sustaining impact of a permanent mural presence that addresses issues of resilience, struggle, community connection, and recovery? From the community-level findings we know that a public mural has a powerful short-term impact on neighborhood residents that can protect against health risks. Thus, two questions are: What is the long-term impact of murals on residents in recovery and do such murals reinforce individual processes of recovery and resilience?

Evaluation Limitations

There are a number of limitations to this evaluation that could have had an impact on the interpretation or conclusions to be drawn from the results. We discuss these separately for the community-level and individual-level results.

Limitations of the Community-Level Evaluation. A significant limitation in the community-level evaluation was that the neighborhoods were not randomly assigned to condition. As a result, we cannot rule out that outcome differences observed between mural and comparison neighborhoods are attributable to other pre-existing or emerging differences across neighborhoods. To minimize that pre-existing differences could account for our findings, we conducted careful systematic observations of physical decay, physical

disorder, and social disorder in each neighborhood and then statistically controlled for each in the analyses. We also controlled for site differences based on the intersections where interviews took place as well as for gender, race, and ethnicity differences among participants, thus minimizing their potential impact, but ultimately these cannot be ruled out completely.

It is also possible that, in the absence of neighborhood random assignment, factors could have emerged differentially in neighborhoods over the course of the evaluation to influence the results. Although this is possible, it is unlikely that such events would be so local and yet so impactful as to affect only a small portion of a particular neighborhood and yet escape the notice of the overall Porch Light team. Also, even if an event was unknown to the Porch Light team, it would likely have become known to the team through our ongoing interviews with neighborhood residents.

Another potential limitation is that the results reflect "experimenter bias." Such bias occurs when the evaluator and research team is "blind" as to the evaluation condition. In this evaluation, for example, they knew in which neighborhoods new murals were installed and in which they were not. Thus, it was possible that those conducting community interviews were implicitly biased toward having participants respond in such a way as to produce positive effects. Interviewer training, bi-weekly interviewer calls, and the careful supervision of the evaluation team should have addressed this issue, but it is still a possibility.

A fourth possible limitation is that since the evaluation design limited interviews and observations to specific intervals, such as 12:00 p.m. to 6:00 p.m., key times for observing or interviewing about neighborhood disorder or decay were missed. However, although it is possible that events took place relevant to evaluation outcomes outside of those designated times, there is no reason to suspect that this varied by the mural and comparison conditions. Relatedly, since interviews and observations were not done in inclement weather and were more likely in certain seasons, the full range of neighborhood life was not observed. Although this was the case, since matched mural and comparison neighborhoods were generally assessed in the same seasons and all neighborhoods were similarly assessed when weather permitted, it is likely that there were minimal systematic bias across conditions for these factors. In fact, by collecting longitudinal data across 1-2 years using both systematic observations and interviews of community residents, the current evaluation improves on the rigor of most neighborhood studies.

A final significant limitation of the community level evaluation is that we cannot determine whether the mural effects observed across two years were due to mostly the passage of time or installing multiple murals near one another in a neighborhood. Disentangling these effects would have required more resources than were available. The analyses we were able to complete with a limited sampling of four neighborhoods was that installation of more than one mural in successive years results in only modest sustained effects beyond those found after one year.

Limitations of the Individual-Level Evaluation. As was the case for the community-level evaluation, for the individual-level evaluation, the absence of random assignment is a limitation on the causal inferences that can be made about individual outcomes. However, the careful matching of agency sites and service populations, the matching of neighborhoods risk characteristics and racial/ethnic composition in which agencies were located, the use of established measures that were completed over multiple assessments, and the incorporation of various statistical controls in the analyses, increases confidence in the findings reported. Also, there remains the possibility of "experimenter effects" despite the extensive training and supervision of interviewers.

The use of CBPR represents both a strength and a limitation of this evaluation. CBPR enabled the evaluation team to develop strong, collaborative partnerships with artists and agency staff to develop a logic model that accurately represents the views of the various stakeholders in the project, including consumers, and also enabled artists and Mural Arts Program staff to implement a program with which they felt most comfortable. The limited rigorous research done on the effectiveness of arts-based behavioral health interventions was an argument in favor of using CBPR to learn more about the process of implementation so that it would inform future work. However, implementing the program in a manner unique to each artist and agency resulted in our effectively examining the three different programs, despite adherence to common implementation phases (Engage, Create, Generate). This made it especially difficult to test the effectiveness of the program model because of the variability in implementation and the resulting small sample sizes at each site. Future research should identify and ensure adherence to common implementation across artists and agencies and then track this closely to assess fidelity to a common program model. In addition, participating agencies should also be required to dedicate staff resources to engage participants after they are enrolled so as to increase program participation and reduce sample attrition. This is what was done in Site C which had the highest rates of attendance and continuing participation.

Importantly, however, artists and agencies that seek to emphasize community-levels effects may not have these constraints. The key consideration when emphasizing community-level effects is the mural itself and its potential

impact on the community. Those artists and sites that have the potential to have a large community impact – even at the expense of not having much individual impact – may still be selected if community-level effects are the priority. In fact, this study shows that public murals may have their biggest impact at the community level. Prioritizing community-level impacts may also be justified at the individual level because the public health benefit that accrues could also be leveraged to address issues of behavioral health stigma that ultimately have individual-level effects.

Implications and Conclusions

We began this report with the question: Can public art promote public health? Our evaluation strongly suggests that the answer is "yes." Public murals promote changes in residents' perceptions about their neighborhood to reduce health risks due to neighborhood decay and disorder. Specifically, increases in residents' perceptions of collective efficacy and neighborhood aesthetic quality in the years following installation of a public mural provide evidence of the public health impact of murals. Another community-level finding was that public murals focused on behavioral health themes and produced with the support of behavioral health consumers and stakeholders, can reduce behavioral health stigma among neighborhood residents.

The evidence in support of an individual health impact of murals is more mixed. Case study interviews of Porch Light participants showed clear individual benefits, and evidence from one agency site that implemented the program with mostly the same group of participants who attended consistently showed modest impacts on stigma and stress. However, when the program was implemented with less frequent or inconsistent attendance in two sites, few effects were observed. Individual results are clearly promising but inconclusive, and await future research in which the program is implemented with greater fidelity and with larger samples.

An unanticipated finding was the differential attrition between Porch Light and comparison participants. Since were no baseline differences in outcomes were observed between these two groups, we do not believe that differential attrition had an impact on outcomes. However, there is the question of whether Porch Light increases engagement in behavioral health treatment, which may enhance recovery. Future research should examine this issue.

Although the evaluation showed impacts on collective efficacy and neighborhood aesthetic quality, the mechanism that explains how public murals lead to these outcomes remains unclear. Possible mechanisms suggested in the case study and the community interviews are that murals stimulate narratives of cultural and community connection, beauty, resilience, and hope. Such narratives may stand in contrast with prevailing narratives of neighborhood decay and disorder, and thus inspire residents to appreciate their neighborhood's aesthetic qualities, foster a sense of cohesion with other neighbors, and nurture a belief that residents look out for one another. The evidence for such a narrative is only conjecture at this point, but is consistent with what we heard from Porch Light participants and community residents, and also aligns with the results of the community-level analyses. Future research should examine these potential mechanisms.

Finally, a defining impact of public murals may be that they serve as a catalyst for social change. The powerful effects observed in this evaluation on neighborhood collective efficacy and aesthetic quality suggest that public murals, at least those done through Porch Light, not only beautify a neighborhood but may also mobilize residents for community action. Elsewhere, the Porch Light collaborative team has described how another Philadelphia mural, Finding the Light Within, which was focused on suicide, mobilized a community that had been touched by the loss of a loved one or someone they knew (Mohatt et al., 2013). That initiative brought together more than 1,200 people who had experienced such a tragic loss. Finding the Light Within provided an opportunity for raising awareness about suicide prevention, reducing the stigma of suicide for loved ones, and bringing together a diverse community for healing.

Perhaps the singular power of murals then is to engage a community, defined geographically or through a common experience, to come together to find meaning and shared purpose, including action for social change. Although creating a mural is a complex process that involves multiple stakeholders, this process may be only a precursor to an even more complex collaboration, one that builds on the outcomes observed here to mobilize diverse stakeholders within a community to address shared needs. That work can take many forms, such as seeking to improve health outcomes or reducing disparities, or addressing other social determinants, such as housing, crime, employment, education, racism, or structural inequities. This may be the true legacy of Porch Light – creating public murals as an opportunity and a catalyst for social change.

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Appendix

Figure A1. Logic Model for the Porch Light Initiative

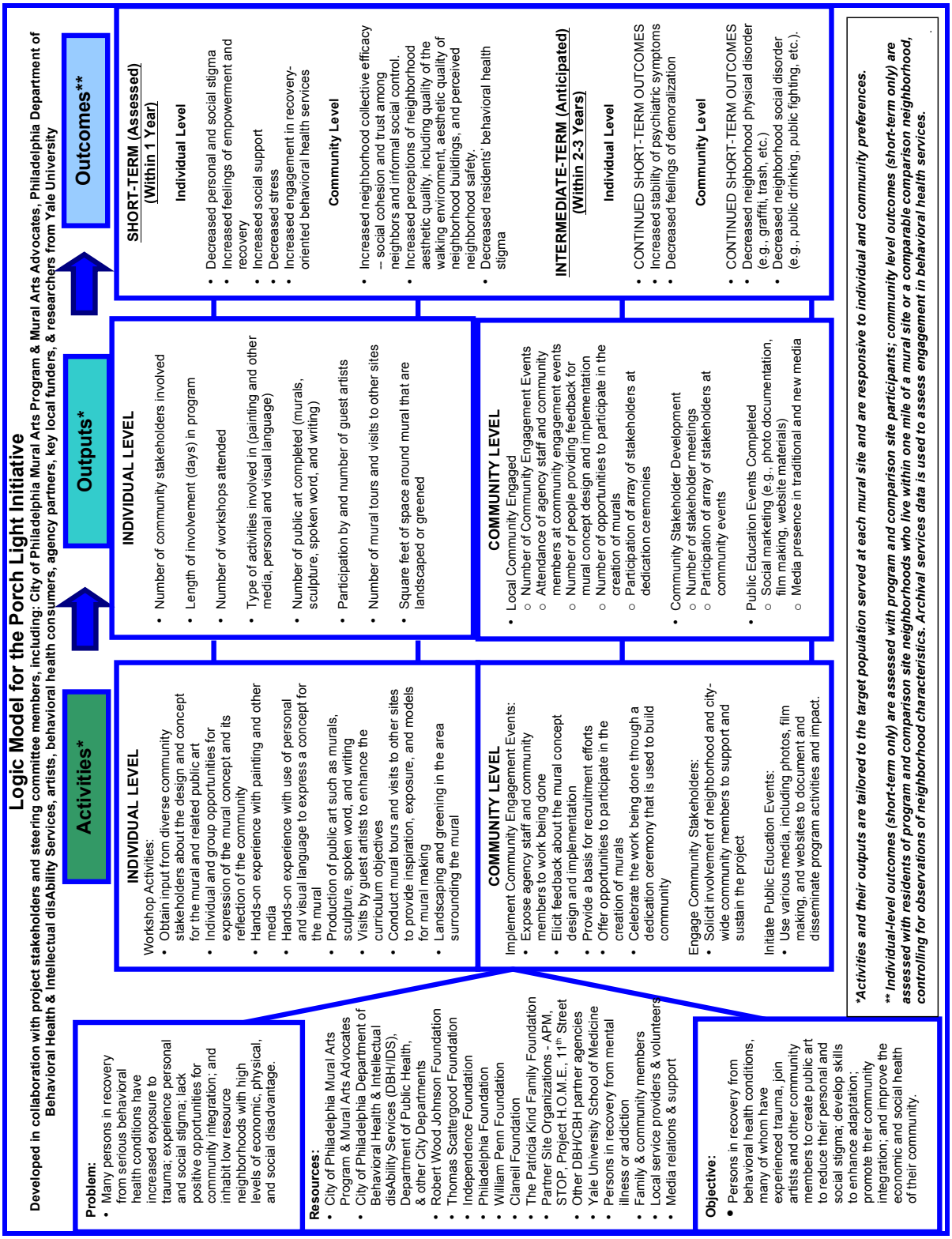

Table A1. Neighborhood Comparative RacialEthnic Composition and Risk Indicators

Neighborhood, Zip Code, & Agency	Neighborhood Characteristics				
	Racial/Ethnic Composition	Below Pov. Lev	Med Hld Income	Unemp. Rate	Crime/ 1000 res.
Fairhill (19140) (APM)	15% Black, 78% Hisp/Lat 6% White, <1% Asian/PI, <1% Other	40	$15,011	22%	66
Fairhill/Hartranft (19133) (Juniata)	53% Black, 40% Hisp/Lat, 5% White, 1% Asian/PI, 1% Other	54	$14,493	22%	88
Glenwood (19132) (STOP)	88% Black, 8% Hisp/Lat 2% White, 1% Asian/PI, 1% Other	41	$22,296	22%	84
Tioga (19140) (Wedge)	86% Black, 7% Hisp/Lat 3% White, 2% Asian/PI, 2% Other	40	$24,891	21%	97
Poplar (19123) (11th Street)	82% Black, 5% Hisp/Lat 9% White, 4% Asian/PI, <1% Other	28	$19,604	14%	57
Tabor (19141) (WES)	78% Black, 10% Hisp/Lat 5% Cauc, 6% Asian/PI, 2% Other	29	$26,550	17%	65
Brewerytown/Strawberry Mansion (19121) (HOME; Neighborhood only)	88% Black, 6% Hisp/Lat 6% White, <1% Asian/PI, <1% Other	53	$13,485	22%	123
Belmont/Haverford North (19104) (Neighborhood only)	87% Black, 5% Hisp/Lat 4% White, 1% Asian/PI, 3% Other	49	$17,684	15%	104

*Data obtained from the U.S. Census by zip code or census tract, and then estimated for the period 2010-2012. Whenever possible, zip code data was aggregated within neighborhood boundaries of the Porch Light evaluation using census tract information and public information databases (City-Data.com and NeighborhoodScout.com). This included obtaining estimates using the intersections for the Porch Light evaluation as the basis for neighborhood boundaries and then aggregating across multiple estimates, as appropriate.

Table A2. Community Interview Intersections and Number of Block Faces Observed

Neighborhood Site	Street Intersections for Interviews	No. of Block Faces Observed
Fairhill (19140)	North Front & West Allegheny; North Front & Westmoreland; North Front & Ontario	22
Fairhill/Hartranft (19133)	Germantown & Huntingdon; Germantown & West Lehigh; Germantown & Somerset	26
Glenwood (19132)	North Broad & York; North Broad & Huntingdon; North Broad & Lehigh	18
Tioga (19140)	North Broad & Venango; North Broad & Pacific; North Broad & Erie to Germantown	13
Brewerytown/ Strawberry Mansion (19121)	Ridge & 26th to 25th; Ridge & Montgomery; Ridge & Cecil B Moore to 24th	27
Belmont/Haverford North (19104)	Lancaster & Brown to 42nd; Lancaster & Aspen; Lancaster & 41st	15
Poplar* (19123)	11th & Fairmont to Brown; 11th & Parish to Poplar; 11th & Girard	26
Tabor* (19141)	Windrim & Lindley to Old York; Windrim & 13th; Windrim & Carmac to 12th	24

*PCHP only.

Table A3a. Detailed Information about Community-Level Interview Measures for the Porch Light Evaluation

Community Level Evaluation – Interview Measures		
Construct	**Measures Used in the Porch Light Evaluation**	**Description**
Neighborhood Collective Efficacy	Social Cohesion and Trust (Sampson et al., 1997) Informal Social Control (Sampson et al., 1997)	**Collective efficacy** was assessed using two separate scales (Sampson et al., 1997), *social cohesion* and trust among neighbors and informal social control. For social cohesion and trust residents were asked to indicate their level of agreement (1=Strongly Agree to 5=Strongly Disagree) to 5 statements (e.g., "People around here are willing to help their neighbors"). Five questions were used to assess *informal social control* (e.g., "If there was a fight in front of a house in this neighborhood and someone were being beaten or threatened, how likely is it that a neighbor would break it up?") to which residents were asked to indicate how likely that action would be taken (from 1=Very Likely to 5=Very Unlikely).
Neighborhood Aesthetic Quality	Overall Neighborhood Aesthetic Quality (Mujahid et al., 2007) Quality of the Walking Environment (Mujahid et al., 2007) Aesthetic Ratings of Specific Buildings (Tebes & Matlin, 2011) Perceived Neighborhood Safety (Mujahid et al., 2007)	**Neighborhood aesthetic quality** was assessed using four measures from Mujahid et al (2007), which had been previously adapted from Sampson et al. (1997): overall neighborhood aesthetic quality (6 items), quality of the walking environment (9 items), and perceived neighborhood safety (3 items). All items were rated on a scale from 1-5 (Strongly Agree-Strongly Disagree). Sample items include, *"In this neighborhood the buildings and homes are well maintained* (neighborhood aesthetic quality);" *"It is pleasant to walk in this neighborhood* (walking environment);" *"I feel safe walking in this neighborhood, day or night* (perceived safety)." Aesthetic ratings of specific buildings (9 items) were designed for this study. Participants were asked to rate affective and aesthetic quality on a scale from 1-7 (1=negative & 7=positive): *"With 1=Thumbs Down and 7=Thumbs Up, what impression does the building make on you?"*
Behavioral Health Stigma	Stigma Devaluation Discrimination Scale (Link et al., 1989)	**Behavioral health stigma** was assessed using 7 items from an adaptation of the Devaluation and Discrimination Scale developed by Link et al. (1989). One additional item was not included in the analyses because it reduced reliability. The six items used were rated on a scale from 1-6 (strongly agree–strongly disagree). A sample item includes: *"Most people believe that a person with an addiction or mental illness is dangerous."* Items were summed for analyses.
Demographic Information	Gender, Race, Ethnicity (Latino/Hispanic)	Participants were asked to indicate their gender, race, & ethnicity (Latino/Hispanic).
Neighborhood Preference Items	Neighborhood likes/dislikes (adapted from Sampson et al., 1997) Ratings of public murals (Tebes & Matlin, 2011)	Participants were asked to identify the "best thing" and "worst thing" about "living in this neighborhood." Residents' responses were then coded and aggregated, with verbatim responses written down. Participants were asked to rate any murals they could recall on a 7-point scale (1=Thumbs down and 7=Thumbs up).

Table A3b. Detailed Information about Individual Interview Measures for the Porch Light Evaluation

Individual Level Evaluation – Interview Measures		
Construct	**Measures Used in the Porch Light Evaluation**	**Description**
Behavioral Health Stigma	Perceived stigma: Devaluation Discrimination Scale (Link et al., 1989)	**Behavioral health stigma** was assessed using 7 items from an adaptation of the Devaluation and Discrimination Scale developed by Link et al. (1989). One additional item was not included in the analyses because it reduced reliability. The six items used were rated on a scale from 1-6 (strongly agree–strongly disagree). A sample item includes: *"Most people believe that a person with an addiction or mental illness is dangerous."* Items were summed for analyses.
	Stigma rejection experiences: Rejection Experiences Subscale (Link et al., 1997)	**Rejection Experiences** (Link et al., 1997) due to social stigma were evaluated with 4 items that rate experiences of rejection related to social stigma. A sample item includes: "Have you ever been avoided by people because they knew you *had an addiction or mental illness*?" Participants responded yes or no to each question, and scores were summed for analyses.
	Use of secrecy to cope with stigma: Secrecy Coping Subscale (Link et al., 1997)	**Secrecy coping** (Link et al., 1997), or how participants managed their social stigma by keeping it a secret, was assessed with 4 items. A sample item includes: *"Do you sometimes hide the fact that you have an addiction or mental illness?"* Participants responded yes or no to each question and scores were summed for analyses.
Recovery	Empowerment: Empowerment Scale (Rogers et al., 1997)	**Empowerment** (Rogers et al., 1997) was evaluated with 15 items from two subscales from the empowerment scale: self-esteem/self-efficacy and community activism/autonomy. A sample item includes: *"I generally accomplish what I set out to do."* Items were rated from 1-5 (Strongly agree-Strongly disagree), and summed for analyses.
	Recovery Assessment: Recovery Assessment Scale (Giffort et al., 1995)	**Recovery Assessment** (Giffort et al., 1995) was assessed with 8 items from two subcales: willingness to ask for help and goa/success orientation. A sample item includes: *"I have goals in my life that I want to reach."* All items were rated from 1-5 (Strongly Agree-Strongly Disagree), and were summed for analyses.
Stress	Stress: Perceived Stress Scale (Cohen et al., 1983)	**The Perceived Stress Scale** (Cohen et al., 1983) assessed stress using 10 items describing feelings and thoughts of stress during the last month. All items were rated from 0 – 4 (Never to Very Often). A sample item includes: *"In the last month, how often have you been upset because of something that happened unexpectedly?"* Scores were summed for analyses.
Social Support	Social Support: Interpersonal Support Evaluation List (Cohen et al., 1985)	**Social support** was assessed using the Interpersonal Support Evaluation List (Cohen et al., 1985), 12-item measure of general social support. Items were rated from 1-4 (Definitely false-definitely true) and summed for analyses. A sample item includes: *"If a family crisis arose, it would be difficult to find someone who could give me good advice about how to handle it."*
Engagement in Recovery-oriented Services	Recovery-oriented services: Recovery Self-Assessment (O'Connell et al., 2005)	Receipt of **recovery-oriented services** from the perspective of a behavioral health consumer were assessed using a modified version of the 16-item Recovery Self-Assessment Scale (O'Connell et al., 2005). Participants rate each question from 1-4 (Strongly disagree – Strongly agree), and items were summed for analyses. A sample item includes: *"Have you ever been avoided by people because they knew you had an addiction or mental illness."*
Client Characteristics	Gender, Race, Ethnicity, Age, & Household income	Participants were asked to indicate their gender, race, ethnicity (Latino-Hispanic), age, and approximate household income.
	Depression: Center for Epidemiological Studies Depression Scale (Radloff, 1977; CESD-D Short-Form (Shrout & Yager, 1989)	**Depressive symptoms** were assessed with the CESD-D Short-Form (Shrout & Yager, 1989) is a 5 item scale that measures depressive symptoms during the past week on a scale from 0-3 (Rarely, Some of the time, Occasionally, Most of the time). Items were summed for analyses. A sample item includes: *"I felt depressed."*
	Psychiatric Symptoms: Brief Symptom Inventory (Derogatis, 2000)	**Psychiatric symptoms** were assessed using the Brief Symptom Inventory (Derogatis, 2000), an 18-item measure of mental health symptoms during the past week, including depression, anxiety/panic, and somatic symptoms rated on a scale of 0-4 (0 = not at all, 4 = extremely). For example, participants indicate how often they had felt, "Scared," and *"Fearful"* during the past week. Items were summed for analyses.

Table A4. Impact of Mural Making on Individual Outcomes - Intention to Treat Sample

	Intervention						Control							
	Pre 2012 Mural		Post 2012 Mural		Post 2013 Mural		Pre 2012 Mural		Post 2012 Mural		Post 2013 Mural			
Variable	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***F***	***p***
Behavioral Health Stigma														
Perceived Stigma	22.48	0.78	25.79	0.77	26.29	0.91	22.09	0.72	26.28	0.75	25.50	0.91	0.74	0.48
Stigma Rejection Experiences	0.95	0.15	0.95	0.18	1.01	0.17	1.21	0.14	1.50	0.17	1.66	0.17	1.78	0.17
Use of Secrecy to Cope with Stigma	1.01	0.14	1.22	0.16	1.12	0.17	1.22	0.13	1.48	0.15	1.80	0.17	2.67	0.07
Recovery														
Empowerment	27.47	0.80	28.35	0.85	27.67	0.90	25.53	0.74	27.20	0.81	26.02	0.89	0.48	0.62
Recovery Assessment Scale	33.98	0.50	33.19	0.53	33.66	0.57	35.23	0.46	34.20	0.51	34.78	0.56	0.08	0.93
Stress and Social Support														
Stress	21.13	0.81	20.75	0.87	19.83	0.90	21.26	0.75	21.27	0.84	21.97	0.90	1.84	0.16
Social Support	37.03	0.89	36.87	0.94	37.07	0.99	33.71	0.83	34.56	0.91	33.78	0.98	0.77	0.46
Engagement in Recovery-Oriented Services														
Recovery Self- Assessment	47.80	1.04	47.12	1.15	47.66	1.35	45.16	0.95	44.58	1.11	44.12	1.37	0.15	0.87

N=260-261. Note. Analyses controlled for gender, ethnicity, race, site, and attendance before baseline. *F* and *p* values are for group *X* time interactions.

Table A5. Impact of Mural Making on Individual Outcomes - Site A

	Intervention						Control							
	Pre 2012 Mural		Post 2012 Mural		Post 2013 Mural		Pre 2012 Mural		Post 2012 Mural		Post 2013 Mural			
Variable	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***F***	***p***
Behavioral Health Stigma														
Perceived Stigma	18.72	2.17	21.72	2.46	19.79	2.92	26.75	1.90	30.21	2.17	29.62	2.52	0.15	0.86
Stigma Rejection Experiences	0.71	0.44	0.84	0.48	0.77	0.47	1.39	0.37	2.41	0.42	2.28	0.41	3.16	0.06
Use of Secrecy to Cope with Stigma	1.13	0.41	0.97	0.40	0.76	0.49	1.59	0.36	2.60	0.36	2.58	0.43	5.04	0.01
Recovery														
Empowerment	31.52	2.80	32.64	2.68	33.11	3.06	29.15	2.44	31.27	2.35	31.87	2.70	0.18	0.84
Recovery Assessment Scale	32.66	1.60	31.60	1.49	31.79	1.63	32.27	1.41	31.83	1.31	31.74	1.44	0.08	0.92
Stress and Social Support														
Stress	25.42	2.29	23.48	2.35	20.78	2.36	20.97	1.99	21.61	2.08	21.30	2.09	6.26	0.01
Social Support	36.52	2.94	37.40	2.75	34.67	3.42	30.90	2.61	33.50	2.49	30.81	3.06	0.43	0.65
Engagement in Recovery-Oriented Services														
Recovery Self- Assessment	51.50	2.75	49.91	2.74	46.98	3.79	38.78	2.41	40.63	2.43	43.60	3.42	2.26	0.12

N=38. Note. Analyses controlled for gender, ethnicity, race, and attendance before baseline. *F* and *p* values are for group *X* time interactions.

Table A6. Effect Sizes of Individual Outcomes at Each Assessment - Site A

Variable	Cohen's *d*corr		
	$Time_1$ –$Time_2$	$Time_2$ –$Time_3$	$Time_1$ –$Time_3$
Behavioral Health Stigma			
Perceived Stigma	0.11	0.11	0.12
Stigma Rejection Experiences	-0.44	0.16	-0.51
Use of Secrecy to Cope with Stigma	-0.85	0.08	-0.77
Recovery			
Empowerment	-0.12	0.23	0.12
Recovery Assessment Scale	-0.18	-0.04	-0.21
Stress and Social Support			
Stress	-0.29	-0.27	-0.56
Social Support	-0.07	-0.36	-0.43
Engagement in Recovery-Oriented Services			
Recovery Self-Assessment	-0.39	-0.62	-1.01

N = 38.
Note. Analyses controlled for gender, ethnicity, race, and attendance before baseline. *F* and *p* values are for group *X* time interactions. Effect size calculated for groups with unequal sample sizes and a pre-post design.

Table A7. Impact of Mural Making on Individual Outcomes - Site B

	Intervention						Control							
	Pre 2012 Mural		Post 2012 Mural		Post 2013 Mural		Pre 2012 Mural		Post 2012 Mural		Post 2013 Mural			
Variable	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*	*F*	*p*
Behavioral Health Stigma														
Perceived Stigma	21.55	1.70	25.91	1.43	25.52	1.63	20.95	1.17	25.39	0.95	24.55	1.09	0.05	0.95
Stigma Rejection Experiences	1.36	0.33	1.57	0.33	1.20	0.35	1.41	0.23	1.22	0.23	1.44	0.23	1.36	0.26
Use of Secrecy to Cope with Stigma	1.14	0.29	1.22	0.27	0.87	0.32	1.22	0.20	1.08	0.18	1.58	0.22	2.79	0.07
Recovery														
Empowerment	26.31	1.50	26.62	1.63	25.28	1.59	25.21	1.00	25.75	1.11	25.07	1.04	0.23	0.80
Recovery Assessment Scale	35.10	0.89	34.35	0.98	34.85	1.06	35.75	0.60	34.76	0.67	34.68	0.72	0.37	0.69
Stress and Social Support														
Stress	20.12	1.71	21.36	1.67	21.24	1.80	20.44	1.15	18.89	1.12	20.21	1.19	2.21	0.12
Social Support	37.71	1.82	36.56	1.87	37.27	1.90	35.80	1.21	36.67	1.25	36.18	1.25	1.05	0.36
Engagement in Recovery-Oriented Services														
Recovery Self- Assessment	46.70	1.89	47.04	2.21	47.67	2.29	48.69	1.27	46.32	1.53	43.49	1.55	3.07	0.05

N = 80.
Note. Analyses controlled for gender, ethnicity, race, and attendance before baseline. *F* and *p* values are for group *X* time interactions.

Table 8. Effect Sizes of Individual Outcomes at Each Assessment - Site B

Variable	Cohen's *d*corr		
	$Time_1$ –$Time_2$	$Time_2$ –$Time_3$	$Time_1$ –$Time_3$
Behavioral Health Stigma			
Perceived Stigma	-0.01	0.14	0.13
Stigma Rejection Experiences	0.28	-0.36	-0.08
Use of Secrecy to Cope with Stigma	0.20	-0.65	-0.44
Recovery			
Empowerment	-0.05	-0.13	-0.19
Recovery Assessment Scale	0.02	0.10	0.12
Stress and Social Support			
Stress	0.31	-0.19	0.14
Social Support	-0.27	0.17	-0.10
Engagement in Recovery-Oriented Services			
Recovery Self-Assessment	0.24	0.48	0.73

N = 80.
Note. Analyses controlled for gender, ethnicity, race, and attendance before baseline. *F* and *p* values are for group *X* time interactions. Effect size calculated for groups with unequal sample sizes and a pre-post design.

Table A9. Impact of Mural Making on Individual Outcomes - Site C

Variable	Cohen's *d*corr		
	$Time_1$ –$Time_2$	$Time_2$ –$Time_3$	$Time_1$ –$Time_3$
Behavioral Health Stigma			
Perceived Stigma	-0.21	0.08	-0.13
Stigma Rejection Experiences	-0.75	0.57	-0.18
Use of Secrecy to Cope with Stigma	0.21	-0.06	0.15
Recovery			
Empowerment	-0.06	0.33	0.27
Recovery Assessment Scale	0.11	-0.34	-0.27
Stress and Social Support			
Stress	-0.39	0.03	-0.37
Social Support	0.02	0.14	0.17
Engagement in Recovery-Oriented Services			
Recovery Self-Assessment	0.28	0.25	0.54

Table A10. Effect Sizes of Individual Outcomes at Each Assessment - Site C

	Intervention						Control							
	Pre 2012 Mural		Post 2012 Mural		Post 2013 Mural		Pre 2012 Mural		Post 2012 Mural		Post 2013 Mural			
Variable	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***M***	***SE***	***F***	***p***
Behavioral Health Stigma														
Perceived Stigma	24.65	2.49	27.24	2.34	28.03	2.80	22.38	1.76	26.28	1.64	26.26	2.13	0.12	0.89
Stigma Rejection Experiences	0.98	0.42	0.39	0.48	1.37	0.54	0.90	0.30	1.32	0.34	1.39	0.40	2.44	0.11
Use of Secrecy to Cope with Stigma	1.05	0.54	1.47	0.58	1.65	0.59	1.52	0.38	1.73	0.41	1.79	0.45	0.27	0.76
Recovery														
Empowerment	25.69	2.82	28.69	2.50	26.46	3.14	28.22	1.97	31.22	1.71	27.86	2.30	0.13	0.88
Recovery Assessment Scale	35.89	1.86	34.64	1.74	35.86	1.61	33.56	1.33	32.04	1.22	34.97	1.22	0.40	0.67
Stress and Social Support														
Stress	18.80	2.84	19.39	2.74	19.20	2.59	22.27	1.99	25.56	1.91	25.70	1.89	0.84	0.44
Social Support	35.10	3.16	35.27	3.27	37.96	3.09	31.06	2.19	31.11	2.28	31.38	2.22	0.69	0.51
Engagement in Recovery-Oriented Services														
Recovery Self-Assessment	46.13	3.67	48.38	3.62	51.43	4.32	43.10	2.61	42.38	2.57	45.30	3.34	0.18	0.84

N = 80.

Note. Analyses controlled for gender, ethnicity, race, and attendance before baseline. *F* and *p* values are for group *X* time

Yale SCHOOL OF MEDICINE
Department of Psychiatry
Division of Prevention & Community Research

The Consultation Center
389 Whitney Avenue
New Haven, CT 06511

consultationcenter.yale.edu