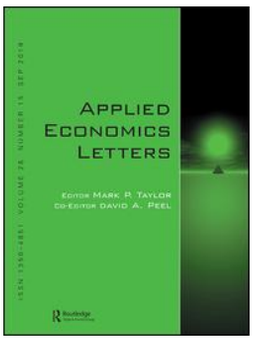

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Applied Economics Letters

ISSN: 1350-4851 (Print) 1466-4291 (Online) Journal homepage: https://www.tandfonline.com/loi/rael20

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To cite this article: Aderaw Anteneh, Kelly Bidwell, Woldemariam Girma, Kristen Little, Nicholas Wilson & Endale Workalemahu (2020): Appraising praise: experimental evidence on positive framing and demand for health services, Applied Economics Letters, DOI: 10.1080/13504851.2020.1761939

To link to this article: https://doi.org/10.1080/13504851.2020.1761939

Published online: 15 May 2020.

APPLIED ECONOMICS LETTERS
https://doi.org/10.1080/13504851.2020.1761939

Routledge
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Appraising praise: experimental evidence on positive framing and demand for health services

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ABSTRACT

Standard economic models of human behaviour take the view that non-informative elements of communication (e.g. tone) do not affect behaviour. Casual observation of consumer and producer behaviour, as well as descriptive evidence, suggests this may be an overly strong assumption in many contexts, including healthcare. For example, 59% of female respondents in the 2011 Ethiopia Demographic and Health Survey reported that 'rude attitude of health provider' was a major problem that prevented them from seeking medical advice and treatment. Yet there is only a small body of evidence on the causal effects of non-informative elements of communication from real-world settings. We conducted a field experiment with over 800 HIV+ female sex workers (FSWs) in Ethiopia testing the effects of providing of Praise Message phone calls on retention in antiretroviral (ART) care and adherence to ART medication. We find mixed evidence on the effects of Praise Messages, suggesting further investigation into the effects of praise or other non-informative communication on health behaviour.

KEYWORDS

Adherence; female sex workers; framing; HIV/AIDS; retention

JEL CLASSIFICATION

D91; I12; I15

I. Introduction

Standard economic models of human behaviour take the view that information affects behaviour through substantive content (e.g. through belief updating). Under this view, non-informative elements of communication (e.g. tone) do not affect behaviour. Casual observation of consumer and producer behaviour, as well as descriptive evidence, suggests this is an overly strong assumption in many contexts, including healthcare. For example, 59% of female respondents in the 2011 Ethiopia Demographic and Health Survey reported that 'rude attitude of health provider' was a major problem that prevented seeking medical advice and treatment.[1] Yet there is only a small body of evidence on causal effects of non-informative elements of communication from real-world settings. We conducted a field experiment with more than 800 HIV+ female sex workers (FSWs) in Ethiopia testing the effects of providing Praise Message phone calls on retention in antiretroviral (ART) care and adherence to ART medication.

Recent field experiments in economics demonstrate that framing can increase individual health savings and investment.[2] These framing interventions include intimating that savings are for health emergencies (Dupas and Robinson 2013), images displaying healthy children as happy children (Luoto et al. 2014), and stating circumcision is for tough men (Wilson et al. 2016; Friedman and Wilson 2018). Whether a simple nudge designed to increase positive feelings about a health behaviour can increase health investment remains an open question.[3]

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[1] At least eight other DHS ask respondents about provider rudeness: Albania (2008), Burundi (2010), Gabon (2012), Lesotho (2009), Nepal (2006), Nigeria (2008), Nigeria (2013) and Zambia (2014), with 63%, 25%, 36%, 41%, 48%, 11%, 16% and 33% of female respondents aged 15–49, respectively, reporting provider rudeness is a 'big problem' in seeking healthcare.

[2] An early article on this topic is McNeil et al. (1982), which examines the effects of framing treatment benefits in terms of the probability of living or the probability of dying.

[3] There is a somewhat related body of literature on media effects and the effects of positive and negative emotional appeals on other economic outcomes (e.g. DellaVigna and Kaplan 2007; Martin and Yurukoglu 2017).

A host of observational studies highlights that a fundamental element of human interaction – positive feelings – is associated with individual investment in health inputs, particularly HIV/AIDS medication adherence. Positive feelings, including trust in healthcare provider, are associated with increased medication (Thom et al. 1999) and ART (Whetten et al. 2006) adherence. Poor therapeutic relationships between patients and providers are associated with reduced medication (Elliott et al. 2000, Okuno et al. 2001, Lacro et al. 2002; Murphy et al. 2003; Osterberg and Blaschke 2005) and ART (Golin et al. 2002; Ickovics and Meade 2002) adherence. Negative feelings, including stigma or a sense of discriminatory behaviour by healthcare workers, are associated with reduced willingness to access HIV/AIDS services (Ameyan et al. 2015). However, there appears to be little causal evidence on the effects of trust, stigma, provider tone or interventions to change these, on retention in HIV/AIDS care and ART adherence.[4,5,6,7,8]

Our Praise Message (PM), described in detail below, was designed to frame the client's choices to attend her appointment and adhere to her medication in a positive light.[9] By telling a client that her nurse wants to congratulate her on filling her prescription and taking care of her health, we hypothesized that the PM would build trust, reduce stigma and build positive feelings. These likely are important factors for HIV+ FSWs, who face the dual stigma associated with these characteristics (e.g. Nyblade 2006; Ito, Lépine, and Treibich 2018).

II. Experimental design and statistical methods

Recruitment and randomization

We recruited and matched data from 832 HIV+ FSWs eligible to begin ART at 25 Drop-in-Clinics (DICs) in the MULU/MARPs HIV Prevention Project.[10] Our sampling strategy recruited all ART-naïve FSWs referred for ART at participating DICs. After screening and study enrolment, participants were randomized into the Standard of Care (SoC) study arm (i.e. the control condition) or the PM study arm, using pairwise randomization stratified at the DIC level. All participants received a phone, SIM and a small amount of airtime sufficient for the PM calls.

Treatment condition and data collection

Case Managers (i.e. peer counsellors) called PM arm participants who attended an ART prescription refill appointment 1 day and 15 days after their completed appointment to deliver the PM. Managers called up to three times to deliver the message if the client was unavailable on the scheduled PM delivery date. The Manager delivered the following message (translated into Amharic):

> "I am calling because your nurse really wanted to congratulate you for filling your prescription yesterday. I also wanted to tell you thank you myself. I know that this is not always easy and we want you to keep up the hard work. Be well!"

The Manager recorded all call attempts, whether the PM was delivered, and the length of the

[4]Chaiyachati et al. (2014) reviewed adherence interventions and found that 26 studies (out of 124 total studies) examined the effects of a'treatment supporter', with roughly 2/3rds finding apositive result for at least one outcome measure. The PM is amuch shorter (and lower cost) intervention than 'treatment supporter' and focuses entirely on providing praise in adiscrete event. "In its place, please substitute: "Chaiyachati et al. (2014) reviewed adherence interventions and found that 26 studies (out of 124 total studies) examined the effects of a 'treatment supporter', with roughly 2/3rds finding a positive result for at least one outcome measure. Among the 17 randomized controlled trials with low risk of bias reviewed in Nieuwlaat et al. (2014), several evaluated complex bundles of interventions that often included treatment supporters. The PM is a much shorter (and lower cost) intervention than 'treatment supporter' and focuses entirely on providing praise in a discrete event.

[5]In a discrete choice experiment in Zambia, Hanson et al. (2005) found that provider rudeness was associated with reduced willingness-to-pay.

[6]Mauer and Harris examine the effect of trust in vaccines on influenza vaccine use.

[7]Lim, Lee, and Hwang (2011) and Hollard and Sene (2016) examine the effect of social capital, as proxied by trust in 'people' and in 'neighbors', on use of healthcare, doctor absenteeism, waiting times, and bribes.

[8]Kovacs, Lagarde, and Cairns (2019) provide evidence on the association between self-reported trust in the provider and an experimental measure of trust.

[9]Non-financial incentives have been shown to be effective at increasing sales of preventive health inputs (Ashraf, Bandiera, and Jack 2014), further reinforcing the evidence base for the hypothesis that the PM – which links the desired behaviour (i.e. appointment adherence) with a non-financial incentive/non-economic reward (i.e. the praise) – may increase individual investment in health inputs.

[10]MULU is a PEPFAR/USAID-funded HIV prevention programme that provides services to female sex workers in 169 towns across Ethiopia. The 25 participating DICs are among the highest volume DICs.

call.[11,12] If questions arose during the phone call, Managers asked the client to call the main DIC phone number.

Study timeline

The Ethiopian Public Health Institute (EPHI) Scientific and Ethical Review Committee (SERC) and the Population Services International Research Ethics Board (REB) reviewed our study and awarded ethical approval in early 2017. We registered our study at ClinicalTrials.gov in April 2017. The study was rolled out to all 25 DICs by the end of May 2017 and recruitment continued through March 2018. We delivered the PM to a client in the PM study arm for up to 6 months.

Data

We have complete data for 832 study participants. We enrolled 866 participants, yet data issues precluded matching 34 participants with medical record information from DIC ART files. Retention in ART care at a given month is defined as attending the follow-up ART refill appointment (or attending a rescheduled appointment within 1 week). Following the Ethiopia Ministry of Health guidelines, 'excellent' ART adherence was defined as having taken ≥95% of doses, determined via pill counts performed by the DIC nurses at each ART visit. We classify participants lost to follow-up as not adhering to ART.

Table 1. Descriptive statistics.

	Mean	Standard deviation
	(1)	(2)
Age 18–19	0.05	0.21
Age 20–24	0.18	0.39
Age 25–29	0.29	0.45
Age 30–34	0.21	0.41
Age 35–39	0.16	0.37
Age 40–44	0.07	0.25
Age 45–49	0.03	0.18
Age 50+	0.01	0.08
Day enrolled	16.26	8.65
Month enrolled	7.27	3.06
Praise Message study arm	0.49	0.50
Praise Message delivered	0.72	0.45
Observations	832	

Note: 'Praise Message delivered' defined conditional on having completed given monthly follow-up appointment.

Table 1 presents descriptive statistics using the sparse information available in the medical records. The median age group is 25–29 and 85% of the sample is age 20–39. Forty-nine per cent of the sample was assigned to the PM arm.

Statistical methods

We use ordinary least squares (OLS) regression to estimate Intention-to-Treat (ITT) effects of the PM. Our primary regression specification is

$$retention_{ij} = \alpha + \beta PM_{ij} + X_{ij}^{'}\Gamma + \gamma_j + \varepsilon_{ij} \qquad (1)$$

where $retention_{ij}$ is an indicator variable equal to one if respondent i was retained in care at a given time (e.g. 1-month follow-up), PM_{ij} indicates PM arm assignment, $X_{ij}^{'}$ is a vector of controls (including enrolment month and indicators for 5-year age group), γ_j are DIC fixed effects, and ε_{ij} is an idiosyncratic error term. We estimate the parameters of Equation (1) using ordinary least squares (OLS) regression and calculate heteroskedasticity-robust standard errors clustered at the DIC level.

We also estimate Local Average Treatment Effects (LATE) using two-stage least squares (2SLS), where we instrument for having received the PM call using an indicator for PM arm assignment. We test the hypothesis that the PM call changed retention in ART care and ART adherence. To conduct the statistical analysis, we use Stata MP 14.1.

III. Results

Balance checks

Table 2 presents the results of the randomization balance check. The available observable characteristics are age and enrolment day and month. We implement this check by regressing an indicator

[11]Kebede et al. (2015) demonstrated that ART patients in Ethiopia were willing to use their cell phones to receive medication reminders, suggesting that patients were willing to receive PM calls. Consistent with this claim, we found that virtually all of the participants found eligible to join the study agreed to do so.

[12]There is a large public health literature indicating that *ex ante* text message reminders can be effective at increasing ART adherence and use of HIV/AIDS services (e.g. Lester et al. 2010; Pop-Eleches et al. 2011; Bigna et al. 2014; Finitsis, Pellowski, and Johnson 2014; Mills et al. 2014; Garofalo et al. 2016; Mbuagbaw et al. 2015).

Table 2. Randomization balance checks.

	Praise Message study arm		
Dependent variable	(1)	(2)	(3)
Age 20–24	−0.012		−0.013
	(0.099)		(0.098)
Age 25–29	0.008		0.005
	(0.093)		(0.093)
Age 30–34	−0.026		−0.029
	(0.093)		(0.093)
Age 35–39	−0.036		−0.037
	(0.089)		(0.088)
Age 40–44	−0.065		−0.068
	(0.132)		(0.132)
Age 45–49	0.010		0.013
	(0.119)		(0.118)
Age 50+	−0.109		−0.108
	(0.243)		(0.239)
Day of Visit 1		0.001	0.001
		(0.002)	(0.002)
Month of Visit 1		0.001	0.001
		(0.005)	(0.004)
$P > F$ (coefficients = 0)	0.839	0.582	0.826
Observations	832	832	832

Notes: Parameters estimated using ordinary least squares (OLS) regression. Robust standard errors clustered at Drop-in-Clinic (DIC) level. All specifications include indicator variables for DIC. Excluded category is age 19 or less.

Table 3. Praise message delivery.

	Delivered
	(1)
Visit 1	
Day after	0.81
Two week	0.76
Visit 2	
Day after	0.83
Two week	0.78
Visit 3	
Day after	0.78
Two week	0.75
Visit 4	
Day after	0.76
Two week	0.73
Visit 5	
Day after	0.69
Two week	0.66
Visit 6	
Day after	0.63
Two week	0.41
Observations	281

Notes: Cells are sample means conditional on retention in care in a given month. Observations report a number of observations for Visit 1 conditional on retention at Visit 1. Sample sizes for subsequent visits vary with retention in care at a given visit.

variable for assignment to the PM arm on observable characteristics at baseline using OLS regression. We conduct a joint *F*-test that the regression coefficients equal to zero. The results suggest that randomization assignment is orthogonal to baseline characteristics.

PM delivery

Table 3 displays PM delivery compliance. Through the first four follow-up visits, between 70–80% of PMs were delivered. For the final two follow-ups, delivery fell to 40-70%. Non-delivery is due to a combination of Manager and client behaviours.

Effects of PM

Figures 1 and 2 display mean retention and adherence by study arm and 95% confidence intervals. For each follow-up interval aside from 5 months, retention/adherence is higher in the PM arm than in the control arm.

Table 4 presents ITT estimates of the effect of the PM on retention (Panel A) and adherence (Panel B). The results reveal a clear pattern of positive coefficient estimates across all but one of the monthly follow-up intervals. To help address power concerns, Column (7) pools all of the 6 monthly intervals. The point estimate in Column (7) of Panel A suggests PM arm assignment increased retention in care by 2.4 percentage points, yet the effect is only marginally statistically significant. Likewise, the point estimate in Column (7) of Panel B suggests PM assignment increased adherence by 2 percentage points, yet the confidence interval is more closely centred around zero, partly because adherence data are missing for several participants.

Table 5 presents LATE estimates of the effect of PM delivery on retention in care and ART adherence. The results reveal a fairly consistent pattern of positive coefficients, yet power issues mean we cannot reject that these are different from zero for any monthly follow-up. The pooled regressions in Column (7), Panels A and B, are highly suggestive that delivery may have increased retention in care and ART adherence, with point estimates in percentage point effects (and *p*-values) of 3.3 (0.091) and 2.9 (0.157), respectively.

IV. Discussion

We find suggestive evidence on the effects of the PM on retention and adherence. The pattern of

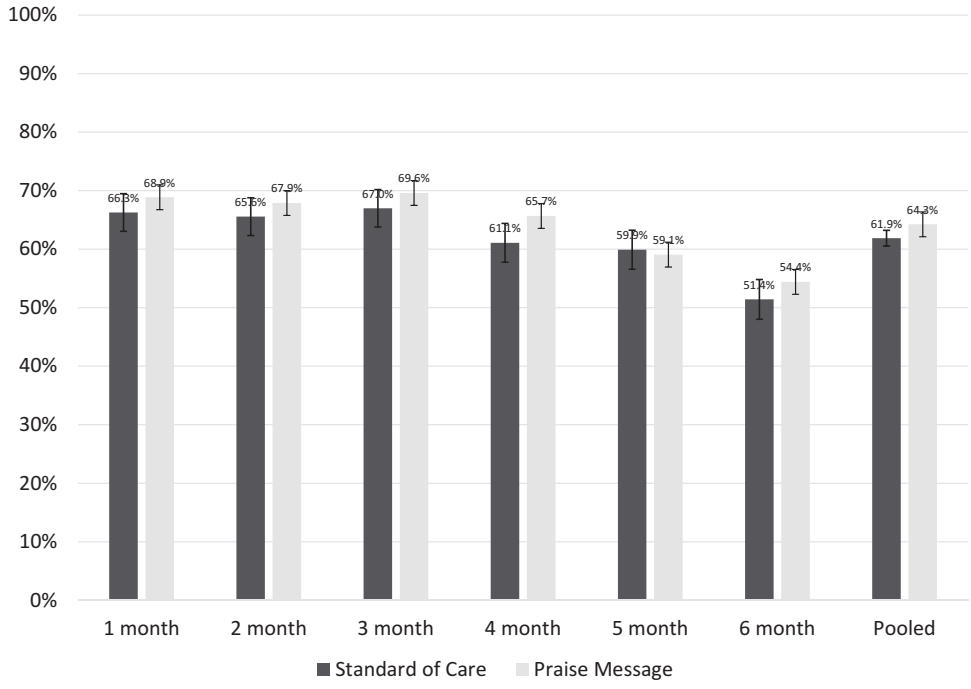

Figure 1. Retention in ART care at monthly follow-up.

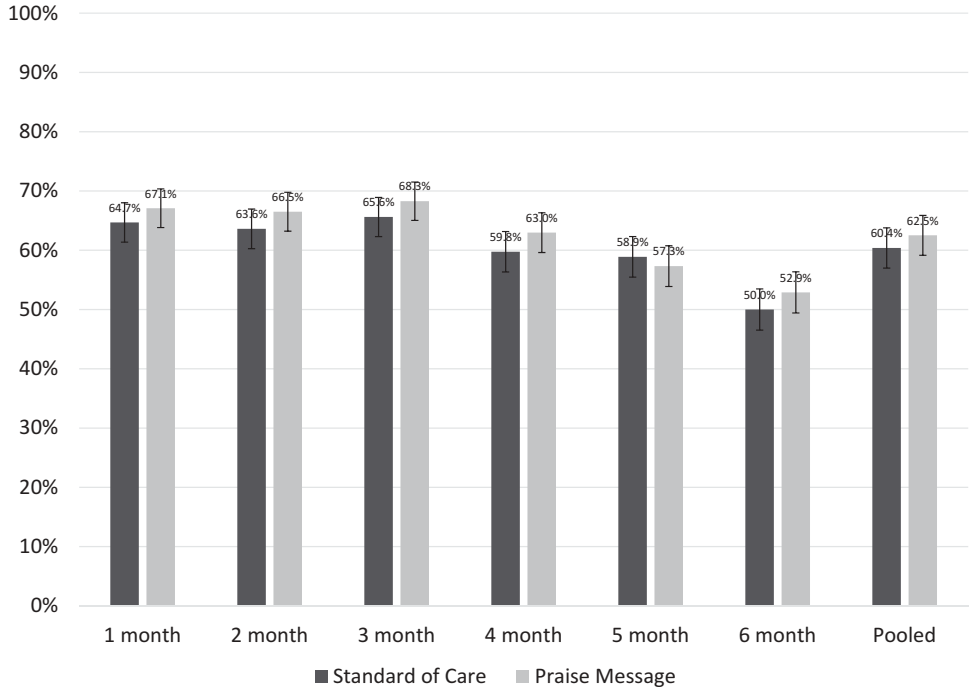

Figure 2. Adherence to ART at monthly follow-up.

coefficient estimates for each monthly follow-up interval reveals a relatively consistent 2–3 percentage point increase in the likelihood of retention (or adherence), although these effects typically are statistically significant only in the pooled retention regressions. Our sample size limits statistical power to detect small effects and we cannot rule out moderately large effects of our PM. Power calculations indicate the minimum detectable effect (MDE) is around a 8 percentage point change in the likelihood of retention (or adherence) at any given monthly follow-up. The

Table 4. Effect of praise messages on retention in care and adherence, intention-to-treat (ITT) estimates.

	1-month	2-month	3-month	4-month	5-month	6-month	Pooled
Follow-up period	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Retention in ART care							
Praise message arm	0.024	0.023	0.025	0.047*	−0.009	0.032	0.024*
	(0.032)	(0.022)	(0.017)	(0.027)	(0.024)	(0.027)	(0.014)
P-values	0.462	0.298	0.153	0.099	0.709	0.248	0.097
Sample mean for outcome	0.675	0.667	0.683	0.633	0.595	0.529	0.629
Observations	832	832	832	832	832	832	4,992
Panel B: Adherence to ART							
Praise message arm	0.024	0.031	0.023	0.032	−0.017	0.026	0.020
	(0.034)	(0.023)	(0.016)	(0.027)	(0.023)	(0.025)	(0.014)
P-values	0.492	0.177	0.170	0.240	0.476	0.306	0.162
Sample mean for outcome	0.660	0.650	0.669	0.613	0.581	0.514	0.613
Observations	793	798	807	812	812	813	4,835

Notes: Parameters estimated using ordinary least squares (OLS) regression. Robust standard errors clustered at Drop-in-Clinic (DIC) level in parentheses. All specifications control for enrolment month and include indicator variables for DIC and 5-year age group. Column (7) further controls for visit number.
***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level.

Table 5. Effect of Praise messages on retention in care and adherence, local average treatment effect (LATE) estimates.

	1-month	2-month	3-month	4-month	5-month	6-month	Pooled
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Retention in ART care							
Praise message delivered	0.032	0.032	0.036	0.073	−0.015	0.066	0.033*
	(0.042)	(0.030)	(0.024)	(0.043)	(0.041)	(0.056)	(0.019)
P-values	0.458	0.292	0.153	0.103	0.710	0.247	0.091
Sample mean for outcome	0.675	0.667	0.683	0.633	0.595	0.529	0.629
Observations	832	832	832	832	832	832	4,992
Panel B: Adherence to ART							
Praise message delivered	0.032	0.043	0.034	0.051	−0.029	0.056	0.029
	(0.045)	(0.031)	(0.024)	(0.042)	(0.041)	(0.053)	(0.020)
P-values	0.489	0.172	0.172	0.242	0.478	0.300	0.157
Sample mean for outcome	0.660	0.650	0.669	0.613	0.581	0.514	0.613
Observations	793	798	807	812	812	813	4,835

Notes: Parameters estimated using instrumental variables (IV) regression, where an indicator variable for assignment to the PM study arm is the instrument for PM delivered. Robust standard errors clustered at Drop-in-Clinic (DIC) level. All specifications control for enrolment month and include indicator variables for DIC and 5-year age group. Column (7) further controls for visit number.
***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level.

consistent pattern and the statistical significance in the pooled retention regressions are highly suggestive that the PM may have been effective at nudging individuals towards healthier behaviours.

Quantitative and qualitative evidence indicates a high degree of acceptability of the PM. There was nearly universal acceptance, with almost all eligible patients agreeing to participate in the study. Case Managers also expressed strong support for the PM. The PM was low cost. Phones, SIMS, airtime cost approximately 30 USD per participant during the 6 months study period. The time required for the call was approximately 2 minutes per client per month.

There are several important limitations of our study. First, we cannot fully rule out an informational channel by which the intentionally *ex post* PM calls served as *ex ante* reminders for the next appointment, although we view the informative component as being quite minimal. Second, we did not examine whether some Case Managers were more effective at delivering the PM, what factors were associated with any 'Case Manager-PM call interaction effects', nor whether instances of multiple Case Managers calling a given FSW over time affected the PM call effectiveness.

Healthcare workers and policymakers should consider formalizing efforts to provide positive feedback to patients, particularly in settings where stigma or negative feedback may be commonplace. Future research should continue to examine the effect of praise in real-world settings.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the United States Agency for International Development [N/A].

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