## Supplementary Method

**Parent Study Inclusion and Exclusion Criteria**

 Data in the present study were drawn from the 20- and 25- year follow-up waves of the Suffolk County Mental Health Project (Bromet et al., 2011; Kotov et al., 2017). Individuals diagnosed with psychotic disorders (cases) were originally recruited between the years of 1990 and 1995 from Suffolk County psychiatric inpatient units. In order to be enrolled in the study at its first wave of data collection, cases met the following criteria: 1) experienced their first psychiatric admission for psychosis within the previous 6 months; 2) the presence of psychosis not due to an organic medical condition; 3) be between the ages of 15 and 60 years old; 4) have an IQ greater than 70; 5) be proficient in English; and 6) be a resident of Suffolk County, NY at the time of admission. Never psychotic comparison subjects were recruited at the 20-year follow up wave, T1 for the present study. Inclusion criteria for these subjects included only the absence of psychotic symptoms. The 20- and 25- year follow up waves were chosen as T1 and T2, respectively, in the present study because they were the first waves at which EEG data has been collected, and the only two waves thus far with EEG data acquisition completed.

**Data Exclusions**

 Participants with usable EEG data at both timepoints were included in the present study. Participants who completed the EEG portion of the study but were not included in the present analyses were excluded for the following reasons: MMN task data missing or skipped/incomplete (timepoint 1: 10 participants; timepoint 2: 22 participants), equipment or file error (timepoint 1: 4 participants; timepoint 2: 5 participants), hearing loss (timepoint 2: 1 participant) and poor-quality EEG data obtained (timepoint 2: 6 participants).

## Measure Reliability

Reliability metrics for positive and negative symptom ratings in this study were calculated using Chronbach’s alpha. The SAPS and SANS, used to assess positive and negative symptoms, have reliability estimates of .862 and .932 respectively at T1 and .841 and .892, respectively, at T2.

## Supplementary Results

## MMN-F Amplitude Stability

 Relative to MMN-D, MMN-F exhibited relatively poor test-retest stability in cases (*r =* .46, p< .001) and NP (*r =* .390, p< .001). MMN-F stability is depicted in **Supplemental Figure 1.**

## Cross-Sectional Correlations

 Cross sectional correlations amongst variables at T1 and T2 are presented in **Supplemental Table 2**. Across all participants and variables examined in the present study, MMN-D was associated with IQ, illness severity, everyday functioning, and negative symptoms at both timepoints, while MMN-F was associated with IQ and illness severity at both timepoints. At T1, relationships also emerged between MMN-D and global positive symptoms and between MMN-F and everyday functioning. Of these, associations of MMN-D and MMN-F with cognition at both timepoints, and of MMN-D with illness severity, everyday functioning, and negative symptoms at T2 remained true when examined in cases independently.

## Prediction Models

Across all predictive models in cases with MMN-F, T1 MMN-F emerged only as a significant predictor of T2 illness severity (β= -.12, *p*=.045). No clinical variables emerged as significant predictors of MMN-F at T2.

# Supplementary Tables & Figures

## Supplemental Figure 1. Frequency MMN Amplitude T1 to T2

**Figure S1 legend:** Scatterplot of test-retest correlations for frequency mismatch negativity (MMN-F) amplitude between timepoint one (T1) and timepoint two (T2) in cases and never-psychotic comparison participants. Amplitude is depicted in microvolts.

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| ***Supplemental Table 1. Descriptive Statistics*** |
| **Psychotic Disorders** |
|   | **T1** | **T2** | **Timepoint Comparison** |
| **Variable** | **Mean** | **SD** | **Mean** | **SD** | **Effect Size** |
| MMN-D | -2.2 | 1.6 | -2.6 | 1.6 |  d = -.25 (*p* = .00) |
| Illness Severity | 47.5 | 16.4 | 45.1 | 15.8 | d = -.15 (*p* = .01) |
| Everyday Functioning | 3.3 | 1.8 | 3.4 | 1.6 | d = .09 (*p* = .20) |
| Positive Symptoms | 7.7 | 10.2 | 8.4 | 9.6 | d = .09 (*p* = .21) |
| Negative Symptoms | 19.2 | 16.0 | 18.7 | 13.9 | d = -.06 (*p* = .32) |
| IQ | 92.4 | 13.3 | 89.5 | 13.9 | d = -.21 (*p* = .00) |
| Auditory Hallucinations | 0.3 | 0.9 | 0.4 | 1.0 | d = .03 (*p* = .75) |
| **Never Psychotic** |
|  | **T1** | **T2** | **Timepoint Comparison** |
| **Variable** | **Mean** | **SD** | **Mean** | **SD** | **Effect Size** |
| MMN-D | -2.8 | 1.8 | -3.3 | 1.8 | d = -.28 (*p* = .00)  |
| Illness Severity | 72.2 | 12.8 | 68.7 | 12.7 | d = -.27 (*p* = .00) |
| Everyday Functioning | 5.5 | 0.9 | 5.3 | 1.1 |  d = -.07 (*p* = .42) |
| Positive Symptoms | 1.1 | 2.5 | 1.7 | 2.9 | d = .23 (*p* = .01) |
| Negative Symptoms | 3.6 | 4.7 | 6.1 | 6.9 | d = .42 (*p* = .00) |
| IQ | 103.5 | 8.9 | 101.5 | 9.4 | d = -.16 (*p* = .00) |

MMN-D = Duration Mismatch Negativity; T1 = Timepoint 1, T2 = Timepoint 2; SD = Standard Deviation. Auditory hallucinations not shown in never psychotic group for lack of variance.

 d = Cohen’s d measure of effect size.

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| ***Supplement Table 2. Cross-Sectional Correlations with MMN Amplitude*** |  |
|  | **T1** | **T2** |
|  | **MMN-D** | **MMN-F** | **MMN-D** | **MMN-F** |
|  | **Psychotic Disorders** |
| **Concurrent Illness Severity** | -.17 | -.15 | -.30\* | -.06 |
| **Concurrent Everyday Functioning** | -.05 | -.16 | -.27\*\* | -.02 |
| **Concurrent Negative Symptoms** | .09 | .13 | .31\* | -.06 |
| **Concurrent Positive Symptoms** | .16 | .04 | -.08 | -.08 |
| **Concurrent Auditory Hallucinations** | .08 | -.01 | .10 | .02 |
| **Concurrent IQ** | -.20\* | -.21\* | -.36\* | -.19\* |
|  | **Never-Psychotic** |
| **Concurrent Illness Severity** | -.08 | -.10 | -.17\* | -.12 |
| **Concurrent Everyday Functioning** | .05 | -.00 | -.06 | .02 |
| **Concurrent Negative Symptoms** | .05 | .04 | .09 | .00 |
| **Concurrent Positive Symptoms** | .03 | -.03 | .10 | .10 |
| **Concurrent Auditory Hallucinations** | -.01 | .02 | -.01 | .01 |
| **Concurrent IQ** | -.25\*\* | -.24\*\* | -.22\*\* | -.20\*\* |
| \*Indicates significance at p<.05; \*\*p<.01 |

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| ***Supplemental Table 3. MMN-D Lagged Correlations*** |  |
| **Clinical** | **T1 MMN-D with** **T2 Clinical1** | **T1 Clinical with** **T2 MMN-D** |
| **Never-Psychotic** |
| **Illness Severity** | -.07 | -.11 |
| **Everyday Functioning** | -.14 | -.04 |
| **Negative Symptoms** | .08 | .12 |
| **Positive Symptoms** | .11 | .15 |
| **IQ**  | *-.25\*\** | -.13 |
| Psychotic Disorders |
| **Illness Severity** | *-.24\*\** | *-.28\*\** |
| **Everyday Functioning** | *-.18\** | -.16 |
| **Negative Symptoms**  | .07 | *.27\*\** |
| **Positive Symptoms** | .12 | .04 |
| **Auditory Hallucinations**  | *.22\** | .15 |
| **IQ**  | -.16 | *-.30\*\** |
| \*Indicates significance at p<.05; \*\*p<.01 |
| Italics indicate statistic is significant following correction for multiple comparisons at an FDR of .11In the left column (MMN-D as predictor), MMN at T1 is correlated with Clinical Variables at T2, while in the right column (MMN-D as outcome) Clinical Variables at T1 are correlated with MMN at T2.  |

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| ***Supplemental Table 4. MMN-F Lagged Correlations*** |
|  | **T1 MMN-F with** **T2 Clinical1** | **T1 Clinical with** **T2 MMN-F** |
|  | **Never-Psychotic** |
| **Illness Severity** | -.10 | -.09 |
| **Everyday Functioning** | -.12 | -.06 |
| **Negative Symptoms**  | .03 | .04 |
| **Positive Symptoms** | .06 | .05 |
| **Auditory Hallucinations** | .02 | -.06 |
| **IQ**  | -.19\*\* | -.17\* |
|  | **Psychotic Disorders** |
| **Illness Severity** | -.20\* | -.01 |
| **Everyday Functioning** | -.22\* | -.03 |
| **Negative Symptoms**  | .04 | -.00 |
| **Positive Symptoms** | .01 | -.09 |
| **Auditory Hallucinations** | .04 | -.02 |
| **IQ**  | -.17 | -.23\* |
| \*Indicates significance at p<.05; \*\*p<.01. MMN-F = Frequency Mismatch Negativity. |

1In the left column (MMN-F as predictor), MMN at T1 is correlated with Clinical Variables at T2, while in the right column (MMN-F as outcome) Clinical Variables at T1 are correlated with MMN at T2.

## Supplemental Figure 2. Hypothesized Model

**Figure S2 legend:** A graphical illustration of the model posited by the authors based upon the present findings, wherein individuals with psychotic disorders first experience a decline in cognitive ability, an increase in negative symptoms, and an overall increase in illness severity and decrease in functional ability. This precedes a reduction or worsening of mismatch negativity (MMN) amplitude, which goes on to predict an increase in auditory hallucinations and increase in illness severity. Importantly, this model was not explicitly tested here as the present study contained only two timepoints, and represents a hypothesized model for future study.