# Expanding the Connection between Cognition and Illness Intrusiveness in Multiple Sclerosis: The Contributions of Objective verses Subjective Resilience as a Moderator

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## Background

- Illness intrusiveness arises from disruptions to daily life activities due to a chronic condition, such as multiple sclerosis (MS)[1].
  - Disease factors affect illness intrusiveness, though psychological factors can moderate their relationship.
- The connection between *objective* cognition and illness intrusiveness has been well established in persons with multiple sclerosis (MS)[2-4].
  - However, the role of *subjective* cognition on illness intrusiveness has yet to be explored in MS.
  - It is unclear if resilience, a protective psychological factor[5-8], can affect the strength of the relationship between cognition and illness intrusiveness.

## Objective

1) To examine the associations of objective and subjective cognition with illness intrusiveness.
2) To explore whether resilience moderates the relationships between cognition and illness intrusiveness.

## Methods

**Participants**: 112 persons with MS who were part of a larger cross-sectional study[9].

**Measures:**

- *Illness Intrusiveness*: Illness Intrusiveness Ratings Scale (IIRS) total raw score[2]
- *Subjective Cognition*: Perceived Deficits Questionnaire (PDQ) total score[10]
- *Objective Cognition*: Symbol Digit Modalities Test (SDMT) z-score[11]
- *Resilience*: MS Resiliency Scale (MSRS) total score[12]

**Statistical Analysis:**

- *Aim 1:* a hierarchical regression was done with the IIRS as the dependent variable. Demographics (age, gender, race, ethnicity, and education) were entered into Step 1, PDQ into Step 2, and SDMT into Step 3.
- *Aim 2:* moderation analyses were run using Hayes PROCESS (**Figure 1**), with the PDQ and SDMT as the independent variable in separate models, IIRS as the dependent variable, and MSRS as the moderator.

## Results

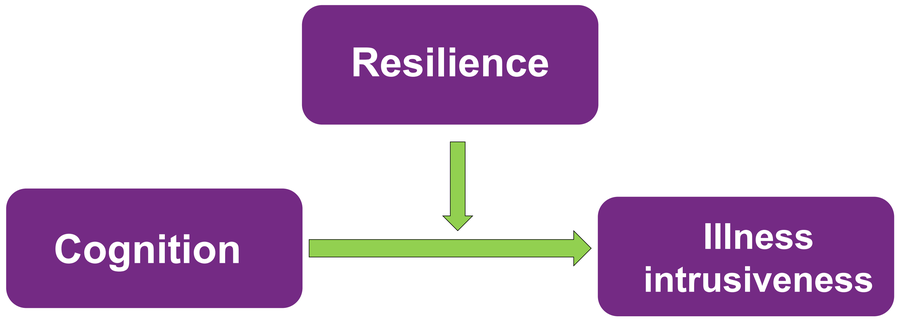


**Figure 1:** Theoretical moderation model of cognition, resilience, and illness intrusiveness

| Variable | B | SE | 95% CI | P-value |
|---|---|---|---|---|
| Constant | 47.41 | 1.53 | | |
| PDQ total score | .31 | .11 | .09, .53 | .006 |
| MSRS total score | -.61 | .15 | -.90, -.33 | <.001 |
| PDQ * MSRS | -.00 | .01 | -.02, .02 | .817 |

**Table 1:** Moderation analysis with illness intrusiveness as the outcome and PDQ as the cognition variable

| Variable | B | SE | 95% CI | P-value |
|---|---|---|---|---|
| Constant | 47.21 | 1.42 | | |
| SDMT z-score | -3.77 | 1.20 | -6.16, -1.39 | .002 |
| MSRS total score | -.67 | .13 | -.94, -.41 | <.001 |
| SDMT * MSRS | .13 | .12 | -.12, .37 | .308 |

**Table 2:** Moderation analysis with illness intrusiveness as the outcome and SDMT as the cognition variable

## Results (Cont.)

**Aim 1:**

- The PDQ was significant in Step 2 of the regression model (b = .53, 95% CI: .29, .77, p <.001), accounting for 15% of the IIRS' variance.
- The SDMT was significant in Step 3 of the regression model (b = -4.17, 95% CI: -6.90, -1.45, p = .003), accounting for 7% of the variance. The PDQ remained significant in the model (b = .43, 95% CI: .19, .67, p = .001).

**Aim 2:**

- While the MSRS independently contributed to the IIRS, it did not moderate the relationship between the PDQ and IIRS (**Table 1**) or SDMT and IIRS (**Table 2**).

## Conclusions

- When looking at how MS interferes in valued, we need to consider both the patient's objective cognitive function as well as their perception.
  - In addition, while it is possible that other factors buffer the effects of cognitive impairment on illness intrusiveness, their level of psychological resilience does not.

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