

A Diagnostic Assessment of Character Dimensions in Rural Elementary Arabic Classrooms

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Article History	Received	Revised	Accepted
	[07/04/2026]	[10/05/2026]	[30/06/2026]

Article Info	
Abstract This study examines the cognitive and socio-emotional character dimensions of elementary school students in rural areas participating in Arabic language learning, using a diagnostic assessment framework. Data were collected from 49 students in grades 4 through 6 using a Likert-scale diagnostic instrument. Descriptive analysis showed a mean cognitive score of 17.39 (SD = 3.24) and a mean socio-emotional score of 36.55 (SD = 6.68), with the socio-emotional dimension showing both a higher level and greater variability. One-sample t-tests confirmed that both cognitive ($t = 37.576$, $p < .001$) and socio-emotional ($t = 38.282$, $p < .001$) scores were significantly above the test value, indicating meaningful internalization of both character dimensions across the sample. One-way ANOVA results, however, showed no statistically significant differences between grade levels for either dimension (cognitive: $p = .900$; socio-emotional: $p = .129$), indicating that grade progression alone did not account for variation in character development within this sample. These findings suggest that Arabic language learning activities contribute to character formation broadly across grade levels, with social-emotional competencies appearing more strongly and more variably developed than cognitive competencies, likely reflecting the influence of rural community and family context rather than grade-level maturation alone.	Keywords character dimensions; diagnostic assessment; Arabic language learning; rural elementary school
Abstrak <i>Penelitian ini mengkaji dimensi karakter kognitif dan sosial-emosional siswa sekolah dasar di wilayah pedesaan yang mengikuti pembelajaran bahasa Arab, menggunakan kerangka asesmen diagnostik. Data dikumpulkan dari 49 siswa kelas 4 hingga 6 menggunakan instrumen diagnostik skala Likert. Analisis deskriptif menunjukkan skor rata-rata kognitif sebesar 17,39 (SD = 3,24) dan skor rata-rata sosial-emosional sebesar 36,55 (SD = 6,68), dengan dimensi sosial-emosional menunjukkan tingkat yang lebih tinggi sekaligus variabilitas yang lebih besar. Uji-t satu sampel mengonfirmasi bahwa skor kognitif ($t = 37,576$, $p < 0,001$) maupun sosial-emosional ($t = 38,282$, $p < 0,001$) signifikan berada di atas nilai uji, menunjukkan internalisasi yang bermakna pada kedua dimensi karakter tersebut di seluruh sampel. Namun, hasil ANOVA satu arah menunjukkan tidak ada perbedaan yang signifikan secara statistik antar tingkat kelas untuk kedua dimensi (kognitif: $p = 0,900$; sosial-emosional: $p = 0,129$), yang menunjukkan bahwa kenaikan kelas semata tidak</i>	Kata Kunci dimensi karakter; asesmen diagnostik; pembelajaran bahasa Arab; sekolah dasar pedesaan

<i>menjelaskan variasi perkembangan karakter dalam sampel ini. Temuan ini menunjukkan bahwa aktivitas pembelajaran bahasa Arab berkontribusi pada pembentukan karakter secara luas di seluruh tingkat kelas, dengan kompetensi sosial-emosional tampak berkembang lebih kuat dan lebih bervariasi dibandingkan kompetensi kognitif, yang kemungkinan mencerminkan pengaruh konteks komunitas dan keluarga pedesaan, bukan semata-mata kematangan tingkat kelas.</i>	
To cite this article: Afyah, N. U., Sulaikho, S., Ningrum, E. W., & Novarinda, D. F. (2026). "A Diagnostic Assessment of Character Dimensions in Rural Elementary Arabic Classrooms" JETLA: Journal of Educational Technology and Learning Arabic, Volume 1, Issue 1, 2026; Page: 27-39	
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INTRODUCTION

Background of the Problem

Character development among elementary school students in Arabic language learning can be evaluated through diagnostic assessment, particularly in rural areas, where students show varying ability levels depending on age and grade ([Ghazali et al., 2024](#)). Diagnostic assessment lets teachers adapt teaching methods to students' needs based on their developmental stage ([Daeng & Fauji, 2025](#)). Character covers more than moral norms alone; it also involves ethno-cultural, socio-emotional, and cognitive aspects of student development ([Ingram et al., 2024](#)). As age and grade level rise, students typically show clearer, more visible progress in diagnostic assessment results, completing tasks in relatively shorter time with smaller score variation ([Willies, 2023](#)). Age plays an important role in early language and literacy acquisition, including in Arabic-language contexts ([Gottardo et al., 2023](#)), and older children or those in higher grades generally show stronger phonological and morphological awareness ([Gottardo et al., 2023](#)). Character development, however, does not always progress uniformly, since its moral, social, and cognitive aspects relate closely to a student's age range. This variability motivated the present study's systematic investigation ([Hacatrjana, 2022](#)).

Research on Arabic language development among young children offers a relevant comparative backdrop. [Öberg and Bohnacker \(2022\)](#) and [Bohnacker et al. \(2021\)](#) find that Arabic language development among Arabic-Swedish-speaking children in Sweden is shaped by age, level of language exposure, and existing speaking ability. Similarly, research across several Arab countries finds that as children between 8 and 30 months grow older, their capacity to use language expands ([Bohnacker et al., 2021](#)). [Queini et al. \(2020\)](#) further find that Arabic language progress relates closely to children's broader verbal development, with higher skill levels appearing first in a child's dominant language. [Zurqoni et al. \(2020\)](#) note that Arabic language learning at Islamic elementary schools in rural areas faces varied challenges, including limited teaching time, suboptimal environmental support, and inadequate facilities. Prior research on Arabic language learning has focused mainly on evaluating motivation, learning outcomes, or students' linguistic ability; comparatively few studies apply a diagnostic assessment approach that

evaluates multiple character dimensions simultaneously, particularly at the elementary level in rural areas ([Sayyidatul Hasna et al., 2023](#)).

This study, accordingly, examines how age relates to elementary students' character development within Arabic language learning, focusing on cognitive and socio-emotional dimensions as key indicators of character quality in a context that inherently combines values, attitudes, and language ability. Prior research, such as [Alwi et al. \(2024\)](#), shows that student character forms not only through moral knowledge but also through everyday learning experience. Building on this view, the present study examines how character development may vary across grade levels, and how students' interaction with their social and cultural environment plays a role in that process.

This study also considers whether older students show more mature character development, drawing on moral and social development theory. [Utami et al. \(2023\)](#) confirm that increasing age typically accompanies improved cognitive ability, empathy, and perspective-taking, a view consistent with [Nursafitri et al. \(2021\)](#), who state that moral development advances alongside growing experience and individual maturity. In the rural school context, unique social and cultural dynamics can also shape how student character forms; as [Sakti et al. \(2024\)](#) and [Lubis et al. \(2024\)](#) explain, the environment in which a child grows plays a role inseparable from moral and social development. This study, then, examines character development not only in relation to age but also in relation to how rural context contributes to that process.

This study, ultimately, aims to enrich understanding of how character education can be implemented more effectively within Arabic language learning, particularly in elementary schools with limited facilities and resources. Rural contexts often carry rich cultural strengths that have received comparatively little academic attention ([Muzzaki et al., 2023](#)). By placing rural students at the center of analysis, this study describes how their character develops within the real situations they face daily. The findings aim to give teachers and schools a foundation for designing Arabic language instruction that builds strong, contextually relevant character alongside linguistic ability, contributing both theoretical insight and practical benefit for character education quality in rural settings.

Identification of Problems

Three problems follow from this background. First, rural elementary schools generally lack a systematic, multi-dimensional way of assessing how Arabic language learning shapes students' character alongside their linguistic skill, since most prior evaluation has focused narrowly on motivation, outcomes, or linguistic ability alone. Second, existing developmental theory predicts that character maturity should rise with age and grade level, yet this prediction has rarely been tested directly through diagnostic assessment data within Arabic-language elementary classrooms in rural Indonesia specifically. Third, rural schools face distinct resource and environmental constraints, limited teaching time, facilities, and support, that may shape character development differently than in better-resourced settings, a possibility that needs empirical examination rather than assumption. These problems point to a gap between the assumption that character competencies grow steadily with age and grade (*das sollen*) and the need for diagnostic

evidence confirming whether that assumption holds in a specific rural Arabic-learning context (das sein).

Formulation of the Problem

Based on this background, the research problems are formulated as follows: first, how do rural elementary students' cognitive and socio-emotional character dimensions present descriptively, and are these dimensions meaningfully internalized above a baseline expectation; and second, do these character dimensions differ significantly across grade levels (grades 4, 5, and 6) within the sample studied.

Objectives and Benefits of Research

Research Objectives

This study aims to assess rural elementary students' cognitive and socio-emotional character dimensions within Arabic language learning using a diagnostic instrument, and to examine whether these dimensions differ significantly across grade levels.

Research Benefits

Theoretically, this study contributes diagnostic, item-level evidence on character dimensions within Arabic language learning in a rural elementary context, an angle prior research has examined less directly than motivation or linguistic outcome alone. Practically, the findings can guide teachers and schools in rural areas toward instructional approaches that support both cognitive and socio-emotional character development, informed by evidence on which dimension needs more deliberate pedagogical attention.

THEORETICAL AND CONCEPTUAL FRAMEWORK

Theoretical Framework

Character, within educational theory, extends beyond moral norms alone to cover ethno-cultural, socio-emotional, and cognitive dimensions of student development ([Ingram et al., 2024](#)). Diagnostic assessment offers a structured way to evaluate these dimensions at the item level, letting teachers identify specific strengths and needs rather than relying on a single aggregate score (Sayyidatul Hasna et al., 2023; Motulo et al., 2024).

Piaget's theory of cognitive development offers a relevant framework for interpreting age-related patterns in elementary students' cognitive character indicators. The theory holds that children roughly aged 10 to 12 are transitioning from the concrete operational stage toward the early formal operational stage, during which the capacity to process abstract information develops gradually rather than emerging fully formed. This framework suggests that cognitive character indicators, which often demand abstract reasoning, may show more limited variation across grade levels within this age range than socio-emotional indicators, which draw more directly on lived social experience.

Moral and social development theory further holds that increasing age typically accompanies improved cognitive ability, empathy, and perspective-taking ([Utami et al., 2023](#)), and that moral development advances alongside growing experience and individual maturity ([Nursafitri et al., 2021](#)). This theoretical expectation, however,

describes a general developmental tendency, not a guarantee that grade-level differences will always reach statistical significance within a specific, relatively narrow age band such as grades 4 through 6, particularly when environmental and cultural factors exert a strong shared influence across a school community.

Socio-emotional development, in turn, draws heavily on environmental and interpersonal context. Rural communities, characterized by communal social structures and close interpersonal relationships, can shape students' socio-emotional character through daily interaction, cooperative norms, and family involvement (Sakti et al., 2024; Lubis et al., 2024). This suggests that socio-emotional character indicators may respond more strongly to shared community context than to individual grade-level progression, which would produce high scores with wide variability, rather than scores that rise steadily and uniformly with grade.

Conceptual Framework

Based on this theoretical foundation, the conceptual framework of this study positions two character dimensions, cognitive and socio-emotional, as outcomes shaped jointly by individual maturation (age and grade level) and shared contextual factors (rural community culture, family involvement, and the nature of Arabic language learning activities). The framework treats these two influences as potentially independent: maturation may raise average competence over time without necessarily producing statistically distinguishable differences between adjacent grade levels, particularly when strong shared contextual factors compress variation across the whole school community. Diagnostic assessment, within this framework, serves two complementary functions: a one-sample comparison against a baseline test value, which indicates whether a character dimension has been meaningfully internalized at all, and a between-grade comparison, which indicates whether grade progression specifically drives further development. Distinguishing these two questions matters because a dimension can be strongly and significantly present across the whole sample while still showing no significant grade-level differentiation, a pattern this study's design is built to detect.

METHODOLOGY

This study was conducted over a three-month period, from August to October 2025, at elementary schools in rural areas that teach Arabic. The study used a quantitative approach with a diagnostic survey design, chosen to analyze students' character profiles based on item-level indicators and to examine differences in character development across grade levels ([Atabik & Muhamad Slamet Yahya, 2022](#)). The research population covered all students in grades 4, 5, and 6 taking Arabic classes in the 2024/2025 academic year. The intended sample, determined through total sampling since every eligible student across the participating schools was included, comprised 51 students (18 in grade 4, 16 in grade 5, and 17 in grade 6); complete, usable data were ultimately obtained from 49 of these students, who formed the analytic sample for the statistical results reported below. The study focused on student character as its primary object of analysis, with Arabic language teachers serving as additional informants to help confirm the accuracy of the learning context ([Nurul Maulidya & Muhammad Hafidz, 2024](#)).

Data collection used a diagnostic assessment instrument in the form of a five-option Likert scale (Hunni'mah, 2024), designed to cover four character dimensions: moral-spiritual, ethical-cultural, socio-emotional, and cognitive responsibility (Motulo et al., 2024). Instrument development drew on a literature review of character theory in elementary education and on item-indicator models used in psychometric diagnostic research. In the statistical analysis reported in the Results section, the moral-spiritual and ethical-cultural items were incorporated into the broader cognitive and socio-emotional composite scores rather than analyzed as fully separate statistical dimensions; this simplification is noted here as a methodological limitation the study carries forward.

Data collection proceeded through a questionnaire administered directly in the classroom with teacher assistance. Each student completed the instrument within 20 to 30 minutes. Completed questionnaires were then checked to confirm that all responses were complete and consistent before analysis. The study used no specialized digital instruments; data collection relied exclusively on paper-based questionnaires, while data entry and statistical analysis were carried out using standard desktop statistical software.

RESULT AND DISCUSSION ANALYSIS

Descriptive Results

The results of this study give a comprehensive picture of elementary students' character development across two primary dimensions: cognitive and socio-emotional. Descriptive statistics, one-sample t-test findings, and one-way ANOVA results together offer a fuller understanding of how students in rural learning environments develop character attributes through their academic and social experience, particularly within Arabic language learning.

Descriptive analysis examined the overall profile of students' character development. A total of 49 students participated in the analysis, with performance evaluated across the cognitive and socio-emotional dimensions. The cognitive dimension showed a mean score of 17.39 with a standard deviation of 3.24. This relatively low standard deviation indicates that students' cognitive performance tends toward homogeneity, suggesting that most students fall within a similar ability range, plausibly reflecting consistent exposure to the same learning materials, teaching methods, and academic environment.

The socio-emotional dimension, by contrast, showed a considerably higher mean score of 36.55 with a standard deviation of 6.68, indicating both a higher overall developmental level and greater variability among students. These results suggest that the socio-emotional traits of students in this rural setting are more strongly developed than their cognitive traits, which typically demand more abstract thinking, analytical reasoning, and higher-order processing. The contrast between the two mean values points toward daily interaction, rural community culture, and collaborative learning practice as more influential for socio-emotional growth than for cognitive development specifically, plausibly reflecting contextual factors such as communal lifestyle, strong interpersonal relationships, and cooperative norms characteristic of rural environments.

Table 1. Descriptive Statistics for Character Dimensions

Dimension	N	Mean	SD
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Cognitive	49	17.39	3.24
Socio-Emotional	49	36.55	6.68

One-Sample T-Test Results

To determine whether mean scores for both dimensions differed significantly from the test value (baseline), a one-sample t-test was conducted for each dimension. This test confirms whether the observed character development is statistically meaningful rather than attributable to chance. For the cognitive dimension, the one-sample t-test produced $t = 37.576$ ($df = 48$, $p < .001$), with a mean difference of 17.39 and a 95% confidence interval of [16.46, 18.32]. These results indicate that students' cognitive scores sit significantly above the test value, meaning cognitive character attributes are present to a meaningful degree; the narrow confidence interval further suggests a reliable, consistent level of cognitive scoring across the sample.

The socio-emotional dimension showed an even stronger result, with $t = 38.282$ ($df = 48$, $p < .001$), a mean difference of 36.55, and a 95% confidence interval of [34.63, 38.47]. This confirms that socio-emotional character development also sits significantly above the test value. The higher t-value indicates stronger statistical significance, while the wider confidence interval reflects greater variability among students, consistent with the descriptive finding that socio-emotional scores vary more than cognitive scores. Together, these t-test results show that both dimensions are significantly developed among students, with the socio-emotional dimension emerging as the more dominant of the two. These outcomes support the interpretation that students' character forms not only through academic learning but also through meaningful social interaction and community-based support.

Table 2. One-Sample T-Test Results

Dimension	t	df	p	Mean Difference	95% CI
Cognitive	37.576	48	< .001	17.39	[16.46, 18.32]
Socio-Emotional	38.282	48	< .001	36.55	[34.63, 38.47]

One-Way ANOVA Results by Grade Level

To complement the descriptive statistics and t-test results, a one-way ANOVA examined whether character development differed significantly across grade levels. Although grade-level comparison was not this study's central objective, the analysis offers additional insight into potential developmental variation among students.

For the cognitive dimension, the ANOVA showed no statistically significant difference across grade levels, with a p-value of .900, far above the conventional .05 threshold, indicating that cognitive scores stayed consistent across grades 4 through 6. The socio-emotional dimension likewise showed no statistically significant grade-level difference; although its F-value (2.141) exceeded that of the cognitive dimension, its p-value (.129) also remained above .05. Neither dimension, then, differed significantly by grade level, which suggests that grade progression alone was not the primary factor shaping character development within this rural sample. Environmental, cultural, and social

conditions, along with community interaction patterns, more plausibly played the larger role.

Table 3. One-Way ANOVA Results by Grade Level

Dimension	F	p	Significant (p < .05)?
Cognitive	—	.900	No
Socio-Emotional	2.141	.129	No

Discussion

Read together, the descriptive statistics, t-test, and ANOVA results give a unified picture of students' character development in this rural setting. Consistent cognitive scores suggest students received broadly similar cognitive stimulation, while higher, more variable socio-emotional scores point to the strong influence of interpersonal interaction and rural community values. The rural environment, marked by strong family ties, cooperative norms, and communal living, appears to nurture socio-emotional skill more readily than cognitive skill. This aligns with research identifying collaborative learning, emotional support from teachers, and daily social engagement as key contributors to socio-emotional development (Gebre et al., 2023). Cognitive development, by contrast, particularly within a subject such as Arabic language learning, depends on structured instructional support, adequate learning resources, and exposure to abstract-thinking tasks; the limited variation observed in cognitive scores suggests a need for more diverse, enriched learning material to stimulate cognitive growth further.

In the cognitive dimension, the mean score of 17.39 reflects students' reasoning ability and grasp of basic concepts, with relatively stable consistency. The low standard deviation suggests homogeneity in students' learning experience, whether in curriculum, teaching method, or educational facility. This pattern aligns with Piaget's cognitive development theory, which holds that children aged 10 to 12 are transitioning from the concrete operational stage toward the early formal operational stage, so their capacity to process abstract information continues developing gradually. The limited score variation may also stem from restricted learning environments and a shortage of varied learning media capable of stimulating higher-order cognitive development.

The higher mean score of 36.55 on the socio-emotional dimension indicates well-developed emotional regulation, empathy, social interaction, and cooperation skill. Rural communities, marked by communal social structure and close interpersonal relationships, appear to contribute meaningfully to shaping students' socio-emotional character. The wider variation in this dimension suggests the influence of individual factors such as parenting style, family dynamics, and degree of social engagement. These findings align with Pebriana et al. (2025), who stress the role of social interaction and collaborative learning in strengthening elementary students' socio-emotional development.

The high t-values across both dimensions indicate that students' character development is genuinely significant, not a product of chance. This suggests that Arabic language learning, although not explicitly designed as a character-education program, still contributes meaningfully to shaping students' cognitive and socio-emotional capacity.

Activities such as reading, dialogue, pronunciation practice, and classroom interaction let students develop cognitive skill and socio-emotional competency simultaneously. The stronger development of socio-emotional traits may stem from the inherently interactive nature of language learning, which encourages communication, cooperation, and social engagement.

These findings reinforce existing literature on the value of diagnostic assessment for mapping student character profiles comprehensively ([Atabik & Muhamad Slamet Yahya, 2022](#)). The role of teachers as contextual informants, as [Ayu et al. \(2025\)](#) emphasize, also proves important for data validity, particularly for socio-emotional aspects that resist objective measurement. Pedagogically, the results suggest a need for differentiated instruction that accounts for students' relatively more homogeneous cognitive development alongside their stronger, more variable socio-emotional strengths. Teachers can draw on students' socio-emotional competency to support collaborative learning, group discussion, and character-based projects, while strengthening cognitive development through more varied learning media, such as educational games, concept visualization, or problem-based learning methods that build abstract reasoning.

The absence of significant grade-level differences in both dimensions deserves particular attention, since it runs against a straightforward expectation that character competence should rise steadily with grade. Two readings of this finding seem plausible. First, within the narrow age band covered here (grades 4 through 6), Piagetian theory itself predicts a gradual, not sharply stepped, transition in abstract reasoning capacity, so grade-to-grade differences may simply be too small to detect reliably within a sample of this size. Second, strong shared contextual factors, the same rural community culture, family structure, and Arabic-learning environment, may exert a leveling effect across grade levels, compressing between-grade variation even as individual character competence continues to develop with age in a broader sense. Distinguishing between these two explanations would need a larger, multi-site sample capable of detecting smaller effect sizes, or a longitudinal design tracking the same students over time.

Limitations

This study carries several limitations. The sample size is comparatively small, drawn from a limited number of schools in one rural district, which restricts how far the findings generalize to other rural or non-rural settings. The diagnostic instrument relies on self-report, which can introduce response bias, particularly for socio-emotional items that ask students to reflect on their own conduct and feelings. The study's own records show a discrepancy between the intended total-sampling frame of 51 students and the 49 students whose data proved complete and usable for analysis; the two unaccounted-for cases should be clarified in any follow-up reporting. The instrument was designed to cover four character dimensions, moral-spiritual, ethical-cultural, socio-emotional, and cognitive responsibility, but the statistical analysis reported here collapses these into two composite dimensions, cognitive and socio-emotional, which means the study cannot speak separately to moral-spiritual or ethical-cultural development as originally intended. Finally, the cross-sectional design captures a single point in time, so it cannot distinguish true developmental change from cohort differences between grades.

Contribution

This study contributes item-level diagnostic evidence, rather than aggregate outcome or motivation measures alone, on cognitive and socio-emotional character dimensions within Arabic language learning in a rural elementary context, a combination prior research has examined separately more often than together. By explicitly distinguishing whether a character dimension is meaningfully present overall (via one-sample t-test) from whether it differs by grade level (via ANOVA), this study offers a methodological template that other diagnostic character studies in Arabic language education can apply, and it surfaces a substantive finding, that socio-emotional character can be strongly and significantly present without being grade-differentiated, worth testing in other rural and non-rural Arabic-learning contexts.

CONCLUSION AND SUGGESTIONS

Conclusion

This study shows that elementary students in the rural Arabic-language classrooms studied here have significantly internalized both cognitive and socio-emotional character dimensions, with the socio-emotional dimension showing both a higher mean level and greater variability than the cognitive dimension. These character competencies, however, did not differ significantly across grade levels 4 through 6, which suggests that within this age range and setting, shared community and instructional context, rather than grade progression alone, plays the larger role in shaping character development. The study carries limitations related to sample size, the rural single-district context, and the collapse of four intended character dimensions into two analyzed composites, which limit how far these findings generalize to a wider population.

Suggestions

For teachers, this study suggests leveraging students' relatively strong, socially grounded socio-emotional competency to support collaborative learning and character-based projects within Arabic instruction, while introducing more varied learning media, such as educational games, concept visualization, and problem-based tasks, to strengthen the comparatively more homogeneous cognitive dimension.

For schools and education authorities in rural areas, this study suggests using diagnostic assessment routinely to track character dimensions alongside linguistic outcomes, since the absence of grade-level differences found here suggests that targeted instructional intervention, not grade progression alone, may be needed to advance character development further.

For future researchers, this study recommends involving schools from multiple regions, using larger samples capable of detecting smaller effect sizes, analyzing all four originally intended character dimensions (moral-spiritual, ethical-cultural, socio-emotional, and cognitive) separately rather than as two composites, and combining quantitative diagnostic data with qualitative methods to deepen understanding of how character development unfolds over time.

AUTHOR CONTRIBUTIONS STATEMENT

Nisa Ul Afiyah conceived the research idea, conducted the diagnostic data collection and statistical analysis, and drafted the manuscript. Siti Sulaikho, Erna Widiya Ningrum, and Dinda Fadhiilla Novarinda contributed to instrument development, data collection in the field, and manuscript revision. All authors approved the final manuscript for publication.

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