MONTGOMERY COUNTY PUBLIC SCHOOLS, ROCKVILLE, MARYLAND

Reliability Analysis of 2022-2023 Staff Climate Survey

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Executive Summary

An item-analysis of the spring 2023 administration of the staff climate surveys for school-based and central office staff was conducted to evaluate the internal consistency (reliability) of the instrument including the assessment as a whole and separately for each of the four individual subscales: *Belonging*, *Climate*, *Equity and Inclusion*, and *Well-Being*. The goal of the item analysis was to review the average value (mean), variability (standard deviation), and internal consistency (reliability) of each item on the instrument to identify potential survey items that may have been problematic. A separate analysis was conducted for the survey items for school-based ($N = 8,638$) and central office staff ($N = 1,326$) because there were variations in the wording on some of the items.

As part of the analysis for each item, the mean and standard deviation was calculated for each of the survey items. The responses for each item were on a descriptive Likert scale where an assigned value was used ranging from 1 to 4. The standard deviations of the items on the subscales ranged from .164 to .421.

The internal consistency of the subscales and the instrument as a whole was evaluated using Cronbach's alpha. Results revealed that the instrument as a whole was reliable as indicated by the strong Cronbach alpha score that exceeded .90 for both staff based in schools and the central office. Additionally, the subscales were reliable with Cronbach alpha values that ranged from .736 to .939.

Key Findings:

- The overall reliability of the instrument used to collect data for the staff climate survey was $\alpha = .930$ for school-based staff and $\alpha = .939$ for central office staff, which indicates that these instruments had strong reliability.
- Analysis of each of the four subscales (*Belonging*, *Climate*, *Equity and Inclusion*, and *Well-Being*) used in the instrument revealed that reliability was good for all four of the subscales, with Cronbach alpha values ranging from .786 to .939.
- Reliability for the *Belonging* subscale ($\alpha = .839$ and $\alpha = .835$) was slightly higher for staff based in schools ($\alpha = .839$) compared to staff based in the central office ($\alpha = .835$).
- Reliability for the *Equity and Inclusion* subscale was lower for staff based in schools ($\alpha = .786$) compared to staff based in the central office ($\alpha = .831$).
- Reliability for the *Well-Being* subscale was higher for staff based in schools ($\alpha = .842$) compared to staff based in the central office ($\alpha = .829$).

Results

Background

The Montgomery County Public Schools (MCPS) staff climate surveys were developed using items included in the suite of Panorama Education surveys which have excellent reliability (Panorama Education, 2014). The survey items covered a range of topics including *Belonging*, *Climate*, *Equity and Inclusion*, and *Well-Being*. In this report, we share the reliability, or internal consistency, of the overall instrument as a whole and for the four individual subscales that were included in the administration of the MCPS climate survey for school-based staff and central-office staff.

Reliability Analysis of Entire Scale

The staff climate surveys were used to measure overall perceptions of staff across four different subscales (*Belonging*, *Climate*, *Equity and Inclusion*, and *Well-Being*). Reliability analyses were conducted to further investigate the reliability of the survey across schools and central offices to determine the quality of the survey items in measuring overall staff climate. First, a reliability analysis of the entire scale was conducted to compare the staff climate surveys for school-based and central office staff by examining the Cronbach's alpha coefficient (α) as shown in Table 1. Previous research has widely used Cronbach's alpha (α) as a statistical measurement of internal consistency, and an alpha of .70 or greater is often a desirable level of consistency (Taber, 2018). Reliability is a statistical term that means consistency. An instrument that is reliable has items that are closely related to each other as a group. In other words, if items on a particular measure are reliable, then the variance of the items are low; they stick together as a group. Results demonstrated that the staff climate surveys for school-based staff (α = .930) and central office staff (α = .939) had good internal consistency.

Reliability Analysis of Subscales

A reliability analysis was also conducted on the items related to the different subscales as shown in Table 1 below. The wording of the items for each subscale was based on whether staff were school-based or central office. A reliability analysis of the four subscales was conducted separately to identify if any items on each of the four subscales were unreliable or problematic for future use. Each subscale was examined individually to see if the reliability of the subscale would have improved if any of the items were deleted from the scale. As part of the reliability analysis, if there was a problematic item, then removing that item would *raise* the overall reliability of the subscale. In contrast, if a given item was reliable, then removing that item would have *lowered* the overall reliability of the subscale. If an item does not fit well into a subscale, often this is indicated by poor reliability of that item compared to the rest of the items in the group for a particular subscale.

Belonging

Belonging was operationally defined as the extent to which staff felt that they were valued members of the school community. The *Belonging* subscale was assessed using three items, and the item analysis showed that the *Belonging* subscale for both the school-based staff climate survey ($\alpha = .839$) and the central office staff climate survey ($\alpha = .835$) had good internal consistency.

Climate

Climate was operationally defined as perceptions of the overall social and learning climate of schools and offices. The *Climate* subscale was assessed using eight items, and the item analysis revealed that the *Climate* subscale for the school-based staff climate survey ($\alpha = .886$) and the central office staff climate survey ($\alpha = .901$) had good internal consistency. Moreover, the Cronbach's alpha coefficient was slightly higher for the central office staff climate survey in comparison to the school-based staff climate survey.

Equity and Inclusion

Equity and Inclusion was operationally defined as perceptions of equity and inclusion in schools and central offices. The *Equity and Inclusion* subscale for the school-based staff climate survey consisted of six items, whereas the *Equity and Inclusion* subscale for the central office staff climate survey consisted of five items. The item analysis showed that the *Equity and Inclusion* subscale for both the school-based staff climate survey ($\alpha = .786$) and central office staff climate survey ($\alpha = .831$) had good internal consistency, despite the Cronbach's alpha coefficient for the school-based staff climate survey being slightly lower in comparison to the central office staff climate survey.

Well-Being

Well-Being was operationally defined as understanding staff self-reports of feelings. The *Well-Being* subscale for both the school-based and central office staff climate survey consisted of four items. Overall, the *Well-Being* subscale for both the school-based staff climate survey ($\alpha = .842$) and the central office staff climate survey ($\alpha = .829$) demonstrated good internal consistency.

Table 1. Descriptive Statistics and Reliability Analysis Results for 2022-2023 Staff Climate Surveys

School-Based Staff Climate Survey					Central Office Staff Climate Survey				
Descriptive Statistics and Reliability Analysis of Entire Scale									
N	*Number of Items*	*M*	*SD*	*α*	*N*	*Number of Items*	*M*	*SD*	*α*
8,638	21	2.698	.268	.930	1,326	20	2.777	.317	.939
Descriptive Statistics and Reliability Analysis of Subscales									
Belonging Subscale									
Number of Items	*M*	*SD*	*α*		*Number of Items*	*M*	*SD*	*α*	
3	2.852	.212	.839		3	2.952	.164	.835	
Climate Subscale									
Number of Items	*M*	*SD*	*α*		*Number of Items*	*M*	*SD*	*α*	
8	2.643	.219	.886		8	2.807	.298	.901	
Equity and Inclusion Subscale									
Number of Items	*M*	*SD*	*α*		*Number of Items*	*M*	*SD*	*α*	
6	2.675	.272	.786		5	2.480	.210	.831	
Well-Being Subscale									
Number of Items	*M*	*SD*	*α*		*Number of Items*	*M*	*SD*	*α*	
4	2.728	.421	.842		4	2.956	.363	.829	

Note. All scale responses for both the School-Based Staff Climate Survey and The Central Office Staff Climate Survey were recorded on a 4-point Likert Scale. *N* = Overall Sample Size; *M* = Means; *SD* = Standard Deviation; *α* = Cronbach's Alpha.

Summary

Results from the reliability analysis of the entire scale showed that the items on the staff climate survey were very reliable in assessing overall staff climate for school-based and central office staff. As shown in Table 1, the Cronbach's alpha coefficient for each survey was above .90. For each of the items, the pattern held where if a respective item was deleted, the Cronbach's alpha score would drop, which is an indication that the item has a unique contribution to the internal consistency of the measure. Additionally, for both the school-based staff survey and central-office staff survey, results from the subscale reliability analysis revealed good internal consistency since the Cronbach's alpha coefficient values were all above .70.

The results indicated that both versions of the staff climate survey demonstrated good internal consistency despite the differences in wording between the two sets of surveys and the repetition of items. The items in each subscale made a unique contribution to the overall values for the measures. Based on the psychometric properties, this instrument is appropriate for future administrations with school-based staff and central office staff. In future implementations of the survey, potential modifications that could be made include deletion of any repeated items and wording changes to make parallel versions for staff, students, and parents in terms of the constructs that are measured.

References

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