

INVESTIGATING THE LINK BETWEEN MULTILINGUALISM AND CREATIVITY

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Why does the M-C link matter?

- Both “multilingualism” and “creativity” are “big” topics about which it’s tempting to make strong claims
- One that is often made is that multilingualism makes people and societies more creative (and also more resilient, more open, etc.)
- Creativity is, in turn, assumed to encourage innovation, and innovation to breed prosperity
- If this connection does indeed exist, it would constitute a powerful argument in favour of policies that support
 - Individual *plurilingualism*
 - AND/OR*
 - Societal *multilingualism*

“Menu” and “take-away” of this talk

- The goal of this presentation is to...
 1. discuss the M-C connexion made in the literature, as well as some limitations of the existing literature
 2. propose strategies for overcoming them in the case of *individual* creativity
 3. present the results of a study that overcomes some of these limitations
 4. discuss these results and outline orientations for future research
- Most of results presented here comes from research carried out in the MIME project (“Mobility and Inclusion in Multilingual Europe”; see www.mime-project.org)

Widely shared assumptions: individuals

- The notion that diversity engenders positive effects of various kinds is widespread
- Informally, it is quite often accepted that:
 - a **person** harbouring more linguistic and cultural diversity (through a more varied experience of life gained through travel, or if s/he speaks more languages) will be more creative
 - This is encapsulated in various frequently-heard aphorisms, e.g. “[Kolik jazyků znáš, tolikrát jsi člověkem.](#)” (*The more languages you know, the more you are human*) (Czech proverb, from the Omniglot website; various variants, including quotes that may be apocryphal)

Widely shared assumptions: groups

- Likewise, it is often assumed that a **group** incorporating more diversity will display more creativity (and therefore perform better when confronting complex tasks), e.g.:
 - “How Diversity is the Mother of Creativity” (enthusiastic on-line article for the general public by J. BAUMGARTNER, <http://www.innovationmanagement.se/imtool-articles/why-diversity-is-the-mother-of-creativity/>)
 - PAGE, S., 2007: *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies*. Princeton: Princeton University Press.

What do we actually know?

- The question needs asking, because many of the claims are rather vague and general, offering a level of robustness comparable to metaphorical pronouncements such as “language is a treasure”, etc.
- In what follows, I focus on language/multilingualism and its possible connection with creativity.
- Research in psycholinguistics has generated a number of interesting results, but:
 - They are not sufficient for establishing a link *in general* (i.e., beyond the specifications of a particular study)
 - They display several limitations which *restrict the applicability* of what connections have actually been measured.

Psycholinguistic findings (1/3)

- Indirect evidence: bilingualism or multilingualism is *correlated* to certain cognitive aptitudes that *may be relevant* to creativity:
 - Mental control & flexibility
 - Metalinguistic awareness & meta-cognition
 - Overall mental fitness
- However, a meta-analysis of 152 studies (LEHTONEN et al., *Psych. Bulletin*, 2018) finds that “available evidence does not provide systematic support for the widely held notion that bilingualism is associated with benefits in cognitive control functions in adults”
- The foregoing suggests that is relevant to actually focus specifically on the multilingualism-creativity link, because creativity is a more complex phenomenon than mental control, flexibility, meta-cognition, etc.

Psycholinguistic findings (2/3)

- Specific focus on the multilingual-creativity link:
 - Higher verbal creativity scores among bilingual children (but no advantage for nonverbal creativity tests)
 - Higher scores on verbal divergent thinking tests among bilingual adults
 - Higher innovative capacity among bilinguals
 - Correlation between language *learning* and classical psychometric *indicators of creativity* (fluency, flexibility, originality, elaboration)

Psycholinguistic findings (3/3)

○ Other connections

- Multilingualism → alternative ways of organizing thought
- Multilingualism → exposure to a variety of cultures → different perspectives on the world → better conditions for idea production and originality
- Experience of living abroad [\leftrightarrow multilingual skills] → enhanced creativity in several tasks
- Summing up: encouraging results, which lend credence to the hypothesis that a connection exists, but it remains difficult to make sweeping inferences (or strategic recommendations) on the basis of these results

Limitations (1/4): def. of multilingualism

- With rare exceptions, studies focus on immigrant children or adults. This may reflect two types of assumptions:
 - One, current in the English-speaking countries where many of these studies have been conducted, is that only (recent) immigrants need to, and are bilingual;
 - The other may be a wish to counter the “deficit diagnostics” often associated with immigrant populations
- However, this severely restricts applicability:
 - 97% of the world population is *not* made up of migrants
 - Billions of people have L2, L3, etc. skills acquired through various forms of language learning (formal, non-formal, etc.)
 - Most research uses a binary vision of multilingualism (yes/no) on one pair of languages, whereas multilingual skills should be seen as a continuous variable, which may span several languages

Limitations (2/4): handling multiculturality

- Many studies do not control for multicultural experience, even though
 - Multilingualism and multicultural experience are often correlated
 - Some studies have shown multicultural experience to be correlated with traits that are linked to creativity
- Therefore, it is important to maintain a distinction between the two and to have data on both, in order to control for the effect of multicultural experience

Limitations (3/4): def. of creativity

- Most studies use very partial indicators of creativity, sometimes just one (“divergent thinking tasks”), which is a restrictive and indirect proxy
- Creativity needs to be conceptualized *and* measured in a more comprehensive and targeted way, relying on the extensive psychometric research available in this area

Limitations (4/4): type of data used

- Many studies rely on small data sets, and/or data sets that contain a relatively narrow range of variables; it makes it difficult to move much beyond bivariate correlations
- However, reaching stronger results requires:
 - a wide range of independent variables for controls (beyond the case of multicultural experience discussed above)
 - a reasonably high N in order to implement a multivariate strategy

Defining multilingualism

- In the study presented here, participants' multilingualism is approached as:
 - ... comprising several languages (L2, L3, L4) – (we allowed for a total of 7 languages), but skills levels were only collected for 3 foreign languages
 - ... being manifested in 4 competences or skills (understanding, speaking, reading, writing)
 - ... which in turn may be higher and lower
- This results in a much more detailed approach to people's linguistic profile than the frequent opposition “bilingual”/“not bilingual”

Measuring multilingualism

- Self-assessment was based on CEFRL-type (“Common European Framework of Reference for Languages”) descriptors
 - (For this purpose, we have used previous experience with these descriptors in the case of trilingual study (D, F, I) with almost 50,000 participants)
- Combining these two dimensions, multilingualism scores aren’t confined to “yes/no”, but encompass, *for each FL*, 28 possible values (and potentially 84 different score values for all 3 FLs taken together)

Defining creativity

- Drawing on psychometric research, creativity is defined here as “the interplay between ability and process by which an individual or group produces an outcome or product that is both novel and useful as defined within some social context”. It allows for a distinction between:
 - Potential creativity
 - General cognitive processes and habits: Idea Generation, Idea Selection
 - Manifest creativity
 - Actual impacts: Interests, Activities, Achievements
- The focus is on “everyday creativity”, as distinct from “eminent creativity” (exceptional genius) as well as from potentially very mundane forms of creativity (e.g. original coping strategies)

Measuring creativity

- In general, measurements of creativity fall in four categories; they may focus on the person (personality, interests), his/her action (processes and activities), or the resulting outcomes (products, achievements)

<i>Type of creativity and degree of domain specificity ↓</i>	<i>INFORMATION COLLECTED THROUGH QUESTIONNAIRES</i>	<i>INFORMATION OBTAINED THROUGH TESTS OR CREATIVITY TASKS</i>
POTENTIAL CREATIVITY (LOW D.S.)	A (person; process)	B (process)
MANIFEST CREATIVITY (HIGH D.S.)	C (activity)	D (outcomes)

- This paper only presents results based on measurements of types A and C

The study

- Data set: N = 596
- 4 waves collected over 8 months in 2015
- Collected in CH, F, B
- Students (72%), general public (28%)
- Questionnaire items included standard personal information plus specific controls
 - Age, gender, education, L1, work activity
 - Experience abroad
 - Travelling abroad
 - Living abroad

Selected results: correlations

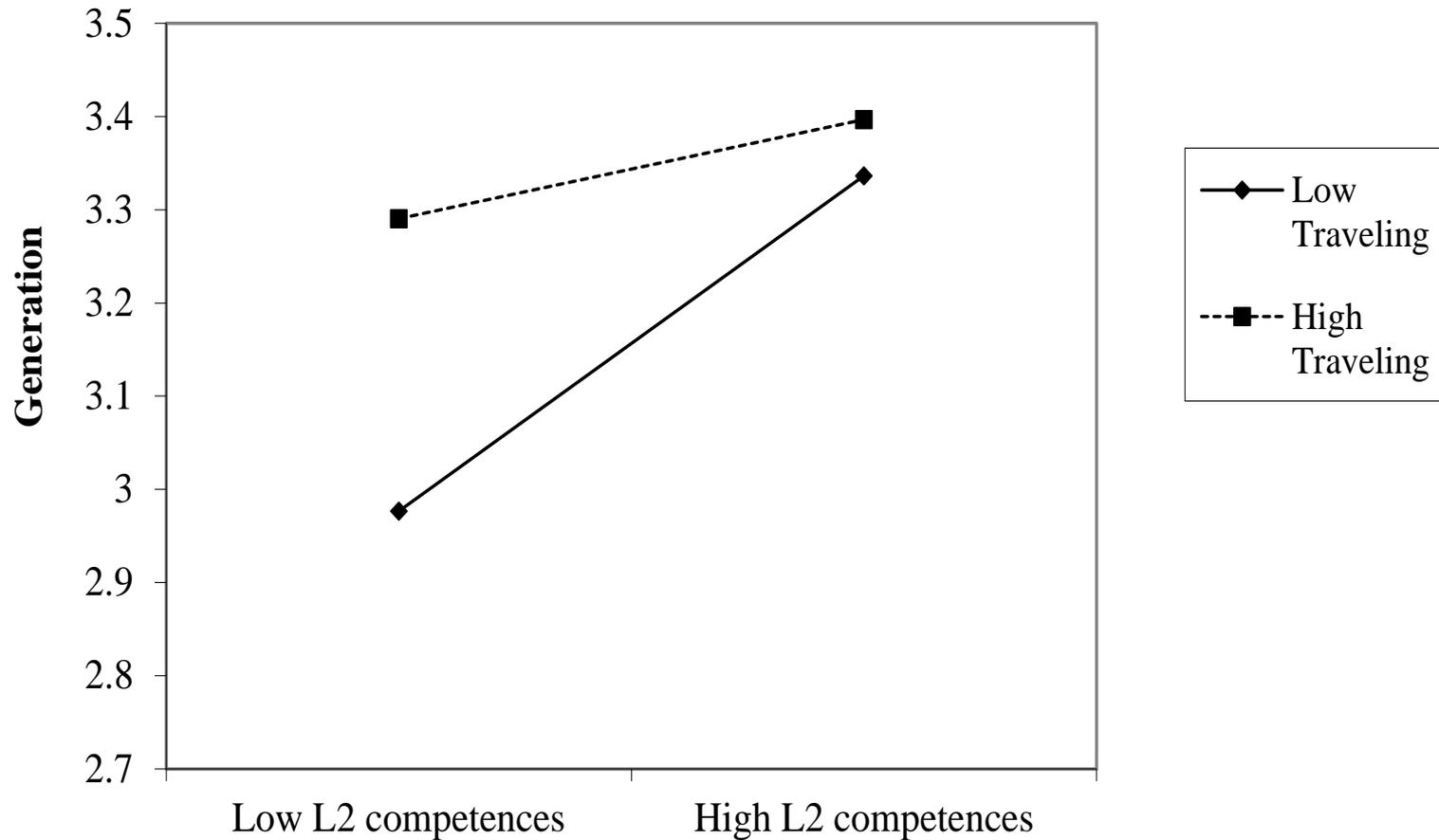
	L2 skills	L3 skills	L4 skills	Total number of languages
Idea generation	.162***	.090*	.091*	.110**
Idea selection	.102*	0.047	0.021	0.027
Creative interests	0.074 [†]	0.051	.086*	.086*
Creative activity (yes/no)	.105*	.095*	0.031	0.076 [†]
Creative activity and achievement (N=491)	.136**	0.071	.091*	.147**

Note. Significance level of correlations: “[†]”: $p < 0.10$; “*”: $p < 0.05$; “**”: $p < 0.01$; “***”: $p < 0.001$.

Selected results: OLS for idea generation

		Model 1		Model 2		Model 3	
		b	p	b	p	b	p
	Const.	3.252	<.001	3.186	<.001	3.327	<.001
	Gender	-0.086	0.184	-0.131	0.046	-0.129	0.047
	Age	0.004	0.227	0.005	0.161	0.001	0.792
	Education	-0.015	0.809	-0.07	0.272	-0.09	0.161
	Prof. Activity	0.149	0.018	0.115	0.069	0.106	0.086
	Sample 2	-0.217	0.043	0.057	0.644	0.208	0.098
	Sample 3	0.379	0.001	0.566	<.001	0.646	<.001
	Sample 4	0.122	0.094	0.169	0.02	0.174	0.017
	L2			0.081	0.001	0.055	0.032
	L3			0.031	0.15	0.021	0.346
	L4			0.012	0.552	0.014	0.478
	Ltot.			0.012	0.805	-0.002	0.968
	Travel					0.034	0.005
	Living abroad					0.033	0.013
	Travel x L2					-0.016	0.038
	Liv. broad x L2					0.004	0.682
	R² (ΔR²)	0.056		0.093 (+0.037)		0.13 (+0.037)	

“Compensating” effect of L2 skills for people who have travelled less



Further results

- Additional results emerge
 - From the use of additional info (e.g. participants' scores on creativity tasks, not presented in the preceding slides)
 - From the use of other techniques, in particular structural equation modelling connecting complex, latent variables (based on the “raw” information)
- Depending on how the data is handled, the correlation between multilingualism and creativity stands at about 0.15 to 0.22 – modest, but statistically significant
- The connections between specific variables taken one by one reveal a large number of small, scattered (but significant) effects. However, shared variance between more abstract, general variables (e.g. “diversity”, combining linguistic *and* cultural traits, and “overall creativity”, including not just questionnaire information, but also scores on creativity tasks), the correlation exceeds 0.50 and is significant at the 1% level

Summary

- At the individual level, diversity appears to be positively correlated to creativity
- This also holds for the “multilingualism” component of individual diversity; the connections are modest, but statistically significant
- Importantly, these findings result from an approach that overcomes frequent limitations in the literature having to do with:
 - The definition and measurement of multilingualism
 - The effect of multicultural experience
 - The definition and measurement of creativity
 - The nature and treatment of the data

Implications

- Results are encouraging, in that they tend to confirm the virtues of multilingualism (consistently positive effects, better tools to measure them). However, many questions remain, in particular:
 1. do more creative individuals (incl. more creative by dint of being more multilingual) “produce” more innovative, more prosperous societies?
 2. *If* it is true that more diverse (and perhaps, specifically, more multilingual) societies are more innovative, resilient, prosperous, etc. – is it
 - a) ... because of the multilingualism embedded in its individual members?
 - b) ... or because individuals are different from each other, and multilingualism and culturally diverse experience appear at the level of groups, or of society as a whole?

Three priorities for future research

- use existing data to investigate how different measurements of creativity differ in their connection with multilingualism (this may also give more clues as to *how* multilingualism enhances creativity)
- closely examine issues of causality and endogeneity between the two sets of variables (M & C)
- study theoretically and empirically the connections between individual and group creativity

Towards policy implications

- Policies targeting individuals in order to foster creativity:
 - Language education policy → FL/L2, etc. skills
 - Support for interlinguistic and intercultural exchange
 - Personalized incentives for foreign travel
- As preconditions for policy development at group level:
 - Identify the conditions under which group-level diversity does foster creativity, etc.
 - If such conditions are found, incentivize ethnic, linguistic and cultural diversity in working teams in the public and private sector
- As preconditions for policy development at societal level:
 - Identify the conditions under which societal diversity genuinely results in more vibrant, more innovative, more resilient, more prosperous societies, assessing whether this link does rest on creative advantage
 - If such conditions are found, select, design and implement language policies that encourage diversity while creating / safeguarding such conditions

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